NOISE IMPACT ASSESSMENT STATEMENT

INTRODUCTION:

This Noise Impact Assessment Statement has been submitted in support of a planning application of conversion of a property form Retail shop E(a) to E(b) Restaurant. This statement provides the details of an environmental sound monitoring survey undertaken at the property and the details and results of an impact assessment in accordance with the requirement of London Borough of Tower Hamlets.

SITE DESCRIPTION:

The building at 59 Burdett Road, London E3 4TN is a three storey structure located within a mixed-use residential and commercial area. The building itself comprises a commercial unit at ground floor and residential flats above.

The ground floor is currently a retail shop which is proposed to change in a E(b) Restaurant.

The site is bounded by the Yummy Pizza to the north and Gabija Retail shop to the south. The A1205, Burdett Road bounds the site to the west beyond which lies Mile End Park.

The nearest affected residential properties to the site are those that are directly above the propose Restaurant namely, 59A Burdett Road, London E3 4TN.

The proposed trade Timings of the restaurant is the following.

Monday to Friday:	12:00 to 23:00
Saturday:	12:00 to 23:00
Sunday:	12:00 to 23:00

The activities that are proposed to take place would be inside seating area.

ENVIORNMENTAL NPISE MONITORING:

Baseline environmental sound monitoring was undertaken at the site between Tuesday 12th January to Wednesday 13th January 2021. The survey was commenced at approximately 13:00 on the Tuesday and concluded at approximately 13:00 on the Wednesday. The full details of the monitoring survey are presented in the following sections.

Measurement Location

On order to determine the background noise climate at the nearest affected residential receptors to the site the equipment was installed at the ground floor level of the property at 59 Burdett Road. The sound level meter was secured on a place connected to a tripod at the rear of the property, such that it 1 meter from the façade of the building and approximately 3m above the ground. The prevailing noise climate at this location was considered representative of the background noise climate on the nearest noise sensitive receptors at 59 Burdett road, just above the property.

Instrumentation
The details of the equipment used for the measurements are presented.

The sound level meter was calibrated both prior to and on completion of the survey with no calibration drifts observed. The sound level meter and calibrator have been laboratory calibrated within the last 2 years and 1 year respectively.

Noise Climate

During the site visits to install and collect the equipment, the prevailing noise climate was noted to consist mainly to the general urban environmental noise associated with traffic and pedestrian activity along Burdett Road.

Weather Conditions

Weather conditions throughout the survey were considered to be conductive to the measurement of environmental sound. Wind speeds measured during the beginning of the survey were measured to be an average 1m/s with a temperature of 5 degrees. At the end of the survey, the wind speed was measured to be an average 1m/s with a temperature of 6 degrees.

As the survey was unattended, detailed records of weather conditions throughout the survey were not able to be recorded, however, it is understood from weather reports from nearby stations that weather conditions remained dry and still throughout the survey, with wind speeds peaking on Tuesday 12th January 2021 in the afternoon to 2m/s.

Measured Sound Levels

The full results of the noise monitoring survey are shown in Table 1 below and also in the time history graphs in Appendix D.

Table 1 – Summary of Measurement Results

Measurement Period	Daytime (07:00 – 19:00)		Evening-time (23:00 – 07:00)		Night-time (19:00 – 23:00)	
	Average $L_{Aeq,T}$	Typical-Lowest $L_{A90,5min}$	Average $L_{Aeq,T}$	Typical-Lowest $L_{A90,5min}$	Average $L_{Aeq,T}$	Typical-Lowest $L_{A90,5min}$
Tuesday 12 January to Wednesday 13 January	61	42	54	40	42	33

When considering the existing background levels of a site, BS4142:2014, Methods for Rating and Assessing Industrial and Commercial Sound" recommends assessing to the "typical" measured LA9D. Ism1ns background levels, BS 4142:2014 goes on to state:

"In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods"

BS 4142:2014 suggests that statistical analysis is a suitable method to determine the typical background level. This can be carried out calculating the level of the most-commonly occurring $L_{A90, 15mins}$ period during the proposed operating hours of equipment.

We generally consider that designing to the most-commonly occurring $L_{A90, 15mins}$ period is not sufficient during those slightly quieter periods. In our opinion, a more representative value would be the "typical-lowest" level, which can be determined statistically as the lowest rounded $L_{A90, 15mins\ Level}$ which occurs for at least 10% of the assessment period.

Table 2 below presents the background and ambient sound levels measured during the late evening period leading up to the proposed closing time of the facility.

Table 2 – Lowest Existing Sound Levels

Date	Time Period	$L_{Aeq,5min}$ (dB)	$L_{A90,5min}$ (dB)
Tuesday 12 January 2021,	22:30 to 22:35 hours	46	39
	22:35 to 22:40 hours	45	40
	22:40 to 22:45 hours	45	40
	22:45 to 22:50 hours	44	40
	22:50 to 22: 55 hours	45	40
	22:55 to 23:00 hours	44	40

For the purpose of this assessment the lowest $L_{Aeq,5min}$ measured when there was no activity on-site generating noise will be used, as the worst-case scenario. From The table above, the lowest ambient sound level without activity noise from the unit itself was measured to be 44dB.

Relevant Policies:

London Borough of Tower Hamlets:

The requirements of the London Borough of Tower Hamlets in relation to noise from entertainment and leisure premises are stated in their Local Plan 2031 (adopted January 2020). These requirements are presented below.

"Assessment for noise from proposed entertainment and leisure premises or from proposed sensitive uses in close proximity to existing entertainment and leisure premised must include consideration to

amplified and unamplified music, human voices, footfall and vehicle movements and other general activity. Appropriate metrics must be used to measure and assess the noise impact including *LAeq* and *LAmax, LA10 and NR* metrics and as appropriate along with consideration of the source frequency spectrum. The Borough will resist development where it is not possible to achieve the levels for noise from proposed entertainment venues within existing noise sensitive receptors, or from existing entertainment venues within proposed noise sensitive receptors, given below."

Table 3: Noise Levels applicable to proposed industrial and commercial developments

Existing noise sensitive receptor	Assessment location	Design period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAEL (Red)
Dwellings	Garden used for amenity (free field)	Day	The lower of 55dB $LA_{eq,5min}$ or 10dB below existing $LA_{eq,5min}$ Without entertainment noise	56dB to 60dB $LA_{eq,5min}$ or 9dB to 3dB below existing $LA_{eq,5min}$ Without entertainment noise	The lower of 61dB $LA_{eq,5min}$ or 2dB below existing $LA_{eq,5min}$ Without entertainment noise
Dwellings	Garden used for amenity (free field)	Evening	The lower of 50dB $LA_{eq,5min}$ or 10dB below existing $LA_{eq,5min}$ Without entertainment noise	51dB to 55dB $LA_{eq,5min}$ Or 9dB to 3dB below existing $LA_{eq,5min}$ Without entertainment noise	The lower of 56dB $LA_{eq,5min}$ Or 2dB below existing $LA_{eq,5min}$ Without entertainment noise
Dwellings	Garden used for amenity (free field)	Night	The lower of 45dB $LA_{eq,5min}$ Or 10dB below existing $LA_{eq,5min}$ Without entertainment noise	46dB to 50dB $LA_{eq,5min}$ Or 9dB to 3dB below existing $LA_{eq,5min}$ Without entertainment noise	The lower of 51dB $LA_{eq,5min}$ Or 2dB below existing $LA_{eq,5min}$ Without entertainment noise

While the nearest affected noise sensitive receptor at 59 Burdett Road does not have a garden, the above criteria are still considered relevant and applicable at location 1 meter outside of the affected residential windows. In line with the above requirements and based on the results of the lowest background sound level measured during the environmental noise monitoring survey, as highlighted in table 2, an assessment will be undertaken to determine the magnitude of the impact in consideration of the criteria in Table 3.

1. **<u>British Standard 4142:2014</u>**

BS4142:2014 methods for rating and assessing industrial and commercial sound describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

- Sound from industrial and manufacturing processes
- Sound from fixed installations which comprise mechanical and electrical plant and equipment
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises
- Sound from mobile plant and vehicles that is and intrinsic part of the overall sound emanating from premised or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

The methods describe within BS4142:2014 use outdoor sound levels to access the likely effects of sound on people who might be inside or outside a dwelling or premised used for residential purposes upon which sound is incident.

The standard is also applicable to determine rating levels for sound of an industrial or commercial nature at proposed new dwellings or premises used for residential premises. The standard is only appropriate for the assessment of external sound levels.

The assessment method described in BS4142:2014 is based on the continuous sound pressure level produced by a specific source [$L_{Aeq.Tr}$] at the assessment location. Appropriate correction allowing for any tonality, impulsivity, other characteristics or intermittency of the specific sound source are then applied to derive the rating level [$L_{Ar.Tr}$]. The rating level is then compared to the background sound level [$L_{A90,\,T}$] to produce the relative difference, or excess of rating level over background sound level BS4142:2014 quantifies the estimated impact from the excess as:

- Typically, the greater this difference, the greater the magnitude of impact.
- A difference of around *+10dB* or more is likely to be an indication of a significant adverse impact, on the depending context.
- A difference of around *+5dB* is likely to be an indication of an adverse impact, depending on the context
- That lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

NOISE IMPACT ASSESSMENT:

The proposed restaurant will be indoor area.

Patron Numbers:

For the purpose of assessment, we have assumed that the maximum capacity of 20 Patrons using the facility at any one time. Typically, in a conversation between 2 people one would be talking and the other listening. Therefore, for our analysis we have considered a maximum number of 10 Patrons, talking simultaneously. This considered not to be the worst case, as it tends to over-estimate the number of

voices at any one time as typically the area should not be at its maximum capacity. Also these numbers will be presented inside the restaurant.

Affected Receptors:

It has been considered noise associated with the likely activities of the restaurant area on the occupiers of the dwellings directly above floor levels. Noise level at the other receptors will be lower than others, hence potential impact will be reduced.

In order to predict likely restaurant noise level from customers within the area at the nearest affected residential windows, we have undertaken a detailed noise modelling exercise using the commercial noise modelling software cadnaA. The modeling package is based on the guidance within ISO 9613-2:1996 "Acoustics – Attenuation of sound during propagation indoors – Part 2: General method of calculation".

Predicted noise level used within our assessment are based on extrapolated data for each person speaking at a normal voice level. The levels used are presented in a table below, which are derived from ANSI/ASA S3.5-1997 [R2017] "Methods for Calculation of the Speech Intelligibility Index".

Sound Power Level of One Person Speaking with a Normal Voice

Sound Power Level of Normal Voice [dB re $1x10^{-12}$ Pa @ Octave-Band Centre Frequency [Hz]								Overall (L_{WA})
63	125	250	500	1k	2k	4k	8k	
45	55	65	69	63	56	50	45	68

Based on our experience of using this method of prediction for similar areas, a good correlation between predicted and measured data on completion has been found.

The Table below provides a comparison of the predicted worst case L_{Aeq} noise levels associated with the use of the Restaurant/Takeaway area against the lowest ambient sound level based on the requirements of the London Borough of Tower Hamlets.

Table 5 – Summary of Predicted L_{Aeq} Noise Levels [dBA]

Predicted Worst-case Patron Noise Level @ nearest noise sensitive receptor ($L_{Aeq,T}$ dBA)	Lowest Ambient level ($L_{Aeq,5min}$)	Level Difference	NPSE Category (Based on LBTH Requirements)
35	44	-9	LOAEL to SOAEL (Amber)

Based on the above, it can be seen that the predicted noise level is 9dB below the existing ambient noise level, and falling within the boundary between LOAEL and SOAEL according to the guidance by the LBTH.

The predicted level is, however, tending towards LOAEL, suggesting that the impact of the noise associated with the use of the Restaurant is not likely to give rise to complaints from the occupants nearby dwellings.

In addition to the above, consideration is also given to the guidance within the British Standard 4142, as outlined above. The Table below provides a comparison of the predicted worst-case L_{Aeq} noise levels associated with the use of the Restaurant against the typical lowest background [L_{A90}] sound level based on the requirements of the BS4142.

Table 6 - Summary of Predicted LAeq Noise Levels and BS4142:2014[dBA]

Predicted Worst-case Patron Noise Level @ nearest noise sensitive receptor ($L_{Aeq,T}$ dBA)	BS 4142 Feature corrections	Rating Sound Level	Typical-Lowest Background level ($L_{A90,5min}$)
35	+3dB "Other" Human speech can be distinctive within the existing noise climate	38	40

Comparing the above prediction to the likely subjective responses, it can be seen that the predicted level is 2dB below the otherwise prevailing background sound level. BS 4142 states that, Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context. Based on this, it is considered that the risk of complaints from the occupants of the residential properties close to Restaurant are low.

The above assessment is based on a worst-case scenario, with the typically lowest background sound level in the evening being adopted as a basis for setting noise limit and realistic assumption on the maximum number of patrons expected to be speaking simultaneously over the reference period.

Conclusion:

Baseline environmental sound monitoring was undertaken at the site between Tuesday 12th January to Wednesday 13th January 2021 in order to determine the typically prevailing background sound levels at the nearest noise sensitive properties to the site. The nearest affected residential properties to the site are those that are located directly above the Restaurant.

A CadnA software model has been used to assist in the prediction of noise from likely activity associated with the use of takeaway area on the nearby sensitive receptors.

Based on the above, the results of our assessment suggest that the noise levels from activity associated with a new facility is resulting in "LOAEL to SOAEL" with reference to the London Borough of Tower Hamlets Council's criteria. In addition, given the predicted sound level is 2dB below the otherwise background level, the facility is not likely to have an adverse or significant noise impact with the reference to the BS4142:2014.

It is our understanding that on the background noise measurements undertaken, an assessment in accordance with the London Borough of Tower Hamlets and British Standard BS4142:2014. Also, ceiling will be installed with acoustic sound insulation on the site.

The proposed development is within an established mixed residential and commercial area, with other light industrial uses nearby. This context adds further weight to the assessment result suggesting the use of the restaurant will have a low impact on the nearby noise sensitive receptors with respect to noise.

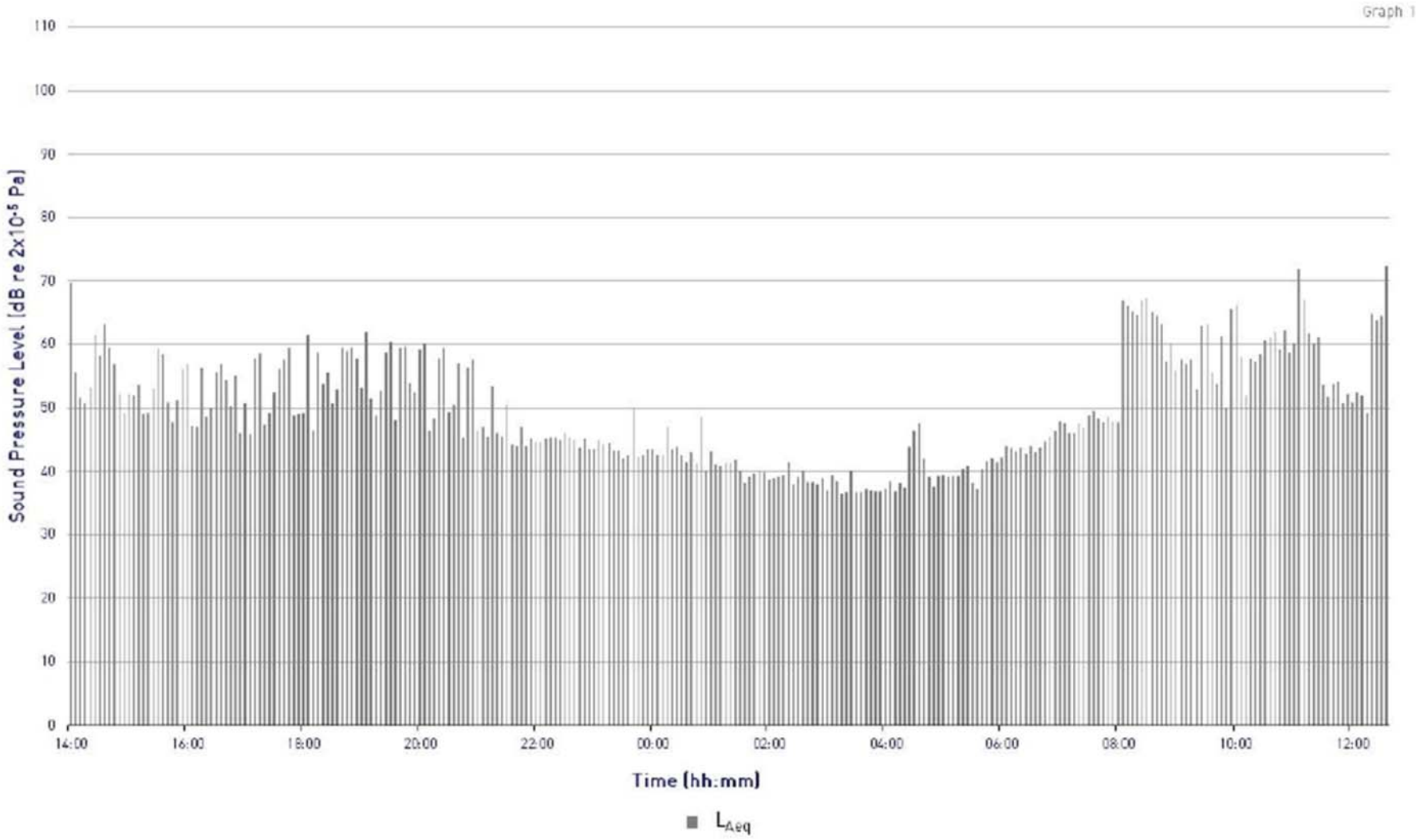
Appendix A - Acoustic Terminology

dB	Decibel - Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.
dB(A)	The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the 'A' weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dB(A) level. Because of being a logarithmic scale noise levels in dB(A) do not have a linear relationship to each other. For similar noises, a change in noise level of 10dB(A) represents a doubling or halving of subjective loudness. A change of 3dB(A) is just perceptible.
L_{eq}	L_{eq} is defined as a notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (1 hour).
L_{Aeq}	The level of notional steady sound which, over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measured over that period.
L_{An} (e.g L_{A10}, L_{A90})	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time, hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the average minimum level and is often used to describe the background noise.
$L_{max,T}$	The instantaneous maximum sound pressure level which occurred during the measurement period, T. It is commonly used to measure the effect of very short duration bursts of noise, such as for example sudden bangs, shouts, car horns, emergency sirens etc. which audibly stand out from the general level of, say, traffic noise, but because of their very short duration, maybe only a very small fraction of a second, may not have any effect on the L_{eq} value.

59 Burdett Road, London.

L_{Aeq} Time History

Tuesday 12th January to Wednesday 13th January 2021



59 Burdett Road, London.

$L_{Amax,f}$-and L_{A90} Time History

Tuesday 12th January to Wednesday 13th January 2021