SOUND ANALYSIS

Consultants in Noise and Vibration

Acoustic Consultancy Report
4205-ENV-ATN-1

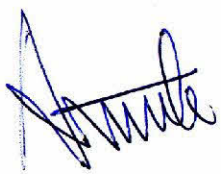
Report on: Proposed Shake Shack Restaurant New Oxford Street, London

Client: OTL Projects Ltd

15th October 2015

Background Noise Measurement, and subsequent Analysis of Mechanical Plant Noise to Atmosphere

Report prepared by:



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1 Introduction

Sound Analysis Ltd was appointed to carry out a background noise survey, and to calculate the predicted airborne noise transmitted from the proposed Mechanical Services Extract Plant to atmosphere, at the proposed Shake Shack project, New Oxford Street London, to nearest neighbouring residential properties.

2 General Arrangement

Sections of Drawings OTL1545/15, and OTL1545/21 are attached in Appendix D, with plant locations indicated.

3 Background Noise Survey

In order to produce a design target, background noise measurements were for 72hrs, taken from 00:02hrs on Friday 9th October, to 22:32hrs on Sunday 11th October 2015.

Weighted sound levels (dB(A)) were measured, with a SvanTeK 977 Class 1 precision sound level meter which was calibrated before and after the survey, and the microphone was fitted with a windshield.

The position of the microphone is indicated in Appendix C. The position was the nearest secure location for the required 72hr unattended survey, and was taken as representative of traffic noise in the area.

The general background noise was due to local traffic, the weather was dry with little wind.

4 Measurement Results

The overall measurements are shown in graph format in Appendix B.

The lowest background levels measured over the period of measurement are as show in the following table.

The operating period of the ventilation plant is to be 10:00hrs to midnight 7days per week.

Table 1: Measured Results

Location	Lowest Measured Background Noise Level – LA90			
	Day Time	Evening	Night Time	10.00 to midnight
New Oxford St Facade	50 dB	50 dB	48 dB	50dB

5 Evaluation of Design Criteria.

Local Council.

Normally the Council Policy is generally based upon BS4142, and the relevant paragraphs from Section 6 are reproduced below:-

BS4142:2014 Methods for rating and assessing industrial and commercial sound

BS4142:2014 states that the 'likelihood of complaints' are to be assessed by subtracting the measured background noise level from the calculated rating level. The following table demonstrates the resultant assessments based upon the calculated rating level.

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) The 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.

In acoustic terms, a calculated rating level 10 dB below the measured background noise level means that the measured background noise level is not increased.

A further 5 dB correction shall be applied in the case of intermittent or tonal plant noise emissions. noise levels shown should be treated as overall noise levels, i.e., the combination of all existing noise levels at the site, and noise levels from any proposed plant or activity.

Design Rating Level

On the basis of BS4142, the design rating level shall therefore be:

Design Rating Level
Lowest measured background L_{A90} 50dB – 10dB(A) = L_{Aeq} 40dB.

6 Analysis Method- Ventilation Plant

The Sound Power level data utilised to calculate the resultant noise level from the Extract Unit is confirmed in Appendix A.

The resultant noise level from the ventilation plant to atmosphere, was calculated, making due allowance for the attenuation provided by bends, duct work, natural barriers, and filtration.

7 Design Target

The noise level predicted at the nearest residential property is L_{Aeq} 32dB, which compliant with the design rating level.

8 Data Provided.

Drawings OTL1545/15, and OTL1545/21 have been used in our analysis, together with the Sound Data, confirmed in Appendix D

9 Calculated Noise Levels

The Extract system is located at roof level, and the resultant level at the nearest residential property, 30m from the discharge opening has been calculated.

The results of the calculations are shown in the following table.

Table: 2

Calculated Noise Levels			
Noise Source	Location	Receiver	Calculated Level – dB(A)
Extract System Discharge	Roof level	Residence at 30m	32

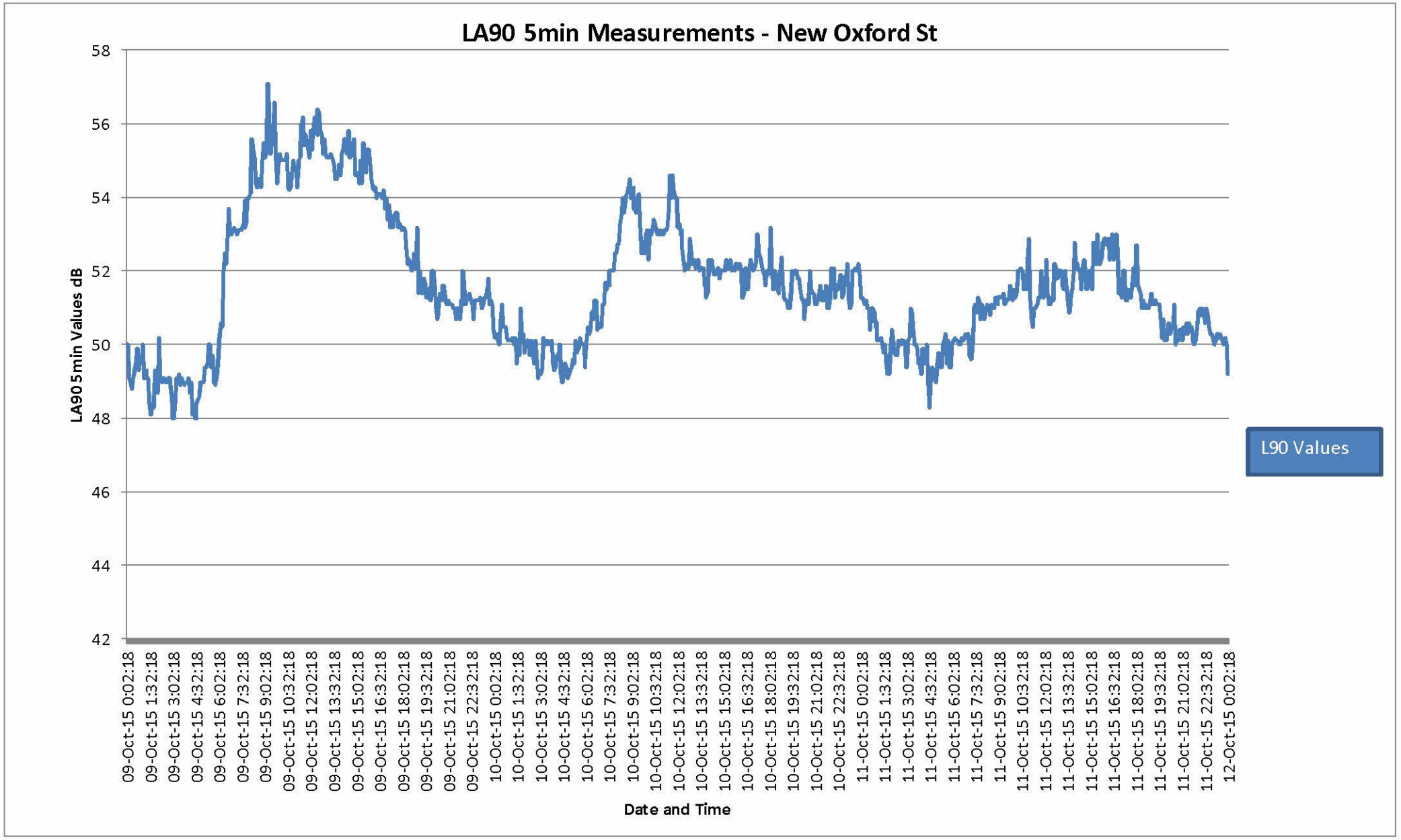
10 Conclusion

The noise from the Extract System discharge is within the design target of LAeq40dB.

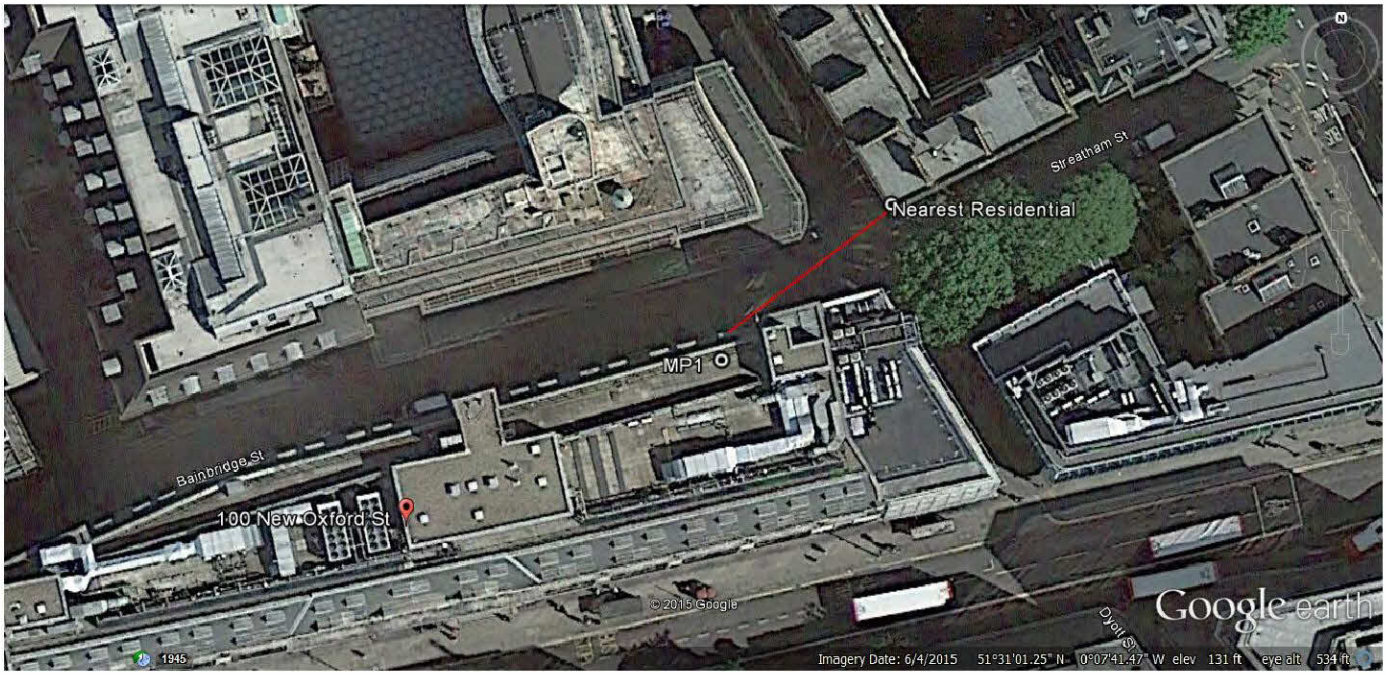
Appendix A: Sound Data Provided.

Plant Item	Sound Power Level re 10^{-12} watts								
	63	125	250	500	1k	2k	4k	8k	Hz
Extract System Discharge	72	72	85	78	75	75	73	71	dB

Appendix B: Noise Level Measurements



Appendix C: Measuring Position



Appendix D. Drawings Provided.