Town and Country Planning Act 1990

Appeal by

Petersham Nurseries Limited

Noise Assessment Survey

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Survey period:	Friday 3rd May to Thursday 9th May 2024
Submitted to:	Mr Simon Ricketts Town Legal LLP 10 Throgmorton Avenue London EC2N 2DL acting on behalf of Petersham Nurseries Limited
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Document status and approval schedule

Revision	Description	Date	Approved
0	Approved for issue	17/05/2024	RV
1	Update location plan and data tables	17/05/2024	RV

Contents

1.0 Introduction

1.1 This document presents the noise survey data gathered at the appeal site.

1.2 In the Inspector's Notes of Case Management Conference held on 23 April 2024 he wrote that in the interests of procedural fairness, it was agreed that the appellant's noise assessment, traffic surveys and light/landscaping assessment would be sent to PINS and the Council by no later than 20 May 2024 and that the Council would immediately notify the public and consultees of receipt of this new evidence giving them until 30 May 2024 to send any representations to the case officer at PINS.

2.0 Proposed noise survey procedure

2.1 The following proposal was made to the LPA on 19th April 2024:

To install noise monitoring equipment close to the boundary wall with Rosebank and leave it there for a week covering the early May bank holiday weekend.

2.2 (In addition an attended noise monitoring session was also carried out on the night of Friday 3rd May 2024 during normal operation of the restaurant until beyond closing time and after all patrons had dispersed).

3.0 LPA response to proposed noise survey procedure

3.1 A response to the proposed noise survey procedure was received from Mr Edward Appah on 24th April 2024 stating:

"The Environmental Health team recommends that the acoustic report must adequately quantify the ambient soundscape with and without the use in place. They also recommend using Guidelines for Noise Impact Assessment 2014 produced by the Institute of Environmental Management and Assessment (IEMA) because it provides a comprehensive methodology for conducting a noise impact assessment and its use would be encouraged. The assessment methodology provides across 7 assessment factors (para 7.14 IEMA Guidelines) that should all be considered.

They are satisfied with the measurement location.

In terms of attending a monitoring session, they are of the view that provided the acoustic survey is undertaken by an individual who holds a recognised acoustic *qualification and membership of an appropriate professional body (The primary professional body for acoustics in the UK is the Institute of Acoustics) then officer attendance would not be necessary."*

4.0 Noise survey procedure

4.1 I visited the site on the afternoon and evening of Friday 3rd May 2024.

4.2 I was already familiar with the location but chose to walk to the site from Richmond railway station in order to appreciate the site location in relation to Richmond town centre, the transport links, and the surrounding road network.

4.3 I walked from Richmond town centre heading south along the A307 Petersham Road. Road traffic going south was flowing, but traffic heading north into the town centre was slow-moving and often stationary. Using the Milestone on the east side of Richmond Bridge as a reference point my journey alongside the A307 continued for approximately 700 metres until I turned off to my right into Buccleuch Gardens. I then took the path known as Capital Ring across Petersham Meadows. This was muddy in parts, but walkable. Other pedestrians and cyclists passed me on the path which leads to the corner of Church Lane at the car parking area next to Petersham Nurseries. The total walking distance was a little under 1500m from Richmond Bridge.

4.4 In order to continuously assess ambient noise levels a logging sound level meter was configured to record and store noise levels at the location shown by the red pin in Figure 1, also identified in the photograph at Figure 2. This location was approximately 50 metres from the restaurant dining area and chosen to be the point on the application site closest to Rose Bank. The microphone was mounted at a location 3m above grade. The instrument and batteries were stored in a weatherproof case and continuously logged data for the following 6 days.

4.5 I walked out through the entrance gate to the nursery and turned right to walk clockwise through the wider area around the appeal site: starting along Church Lane and going past St Peter's Church on my left, then turning right along Petersham Road, and noting heavy road traffic uncomfortably close to the narrow pavement at times, then turning right into River Lane. I walked down River Lane to the Thames, then returned and turned left at The Old Stables and walked along the public footpath that passes alongside Rose Bank. Pedestrians and cyclists were also using this path at this time.

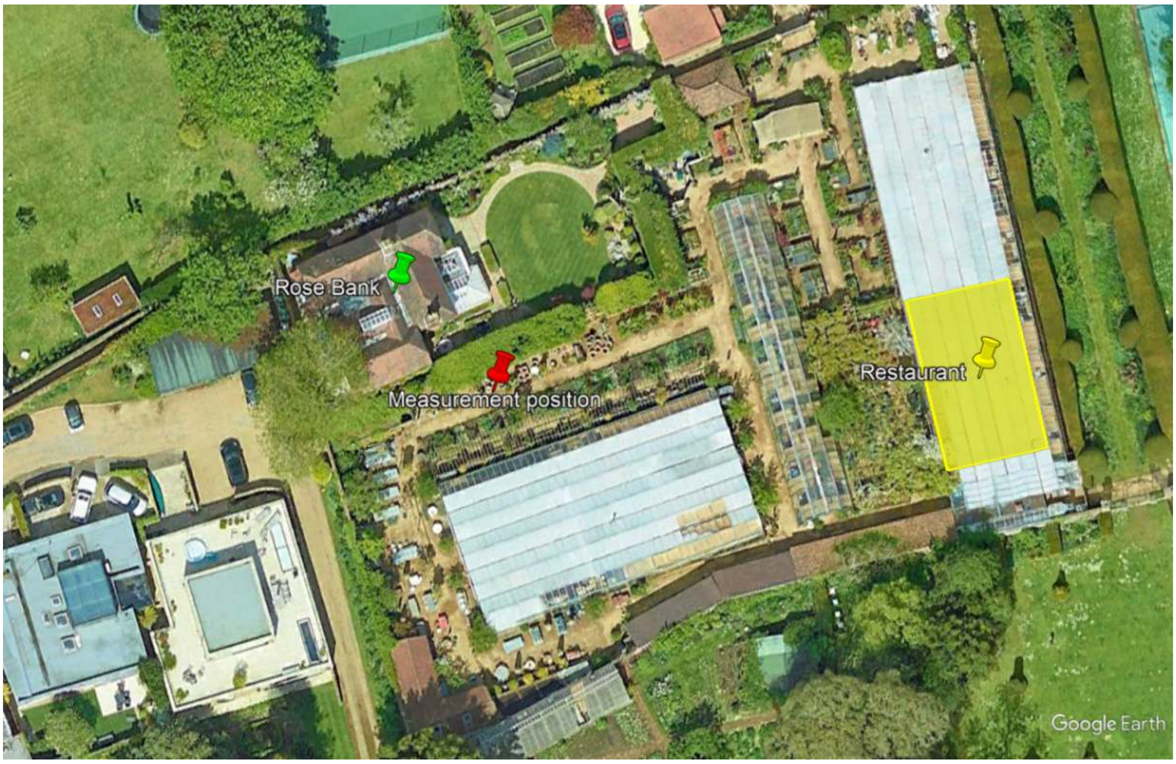

Figure 1: Site plan showing continuous noise logging measurement position

Figure 2: Continuous noise logging measurement position showing microphone location

4.6 I remained on site, or close to the site on the surrounding streets and footpaths, during the Friday night operation of the restaurant and until after all patrons had departed. During this time I took additional attended noise measurements with a hand-held sound level meter.

4.7 Noise measurements were made in continuous samples of 1-second intervals. Measurements included the L_{Aeq}, L_{A90} and L_{Amax} indices which are used to indicate the average noise level sampled over a period, the background noise level, and the maximum noise level respectively. Simultaneous octave and third-octave frequency spectra were also obtained during the survey. Measurements with the hand-held meter were taken at 1.5 m above grade level. Measurement duration was typically 5 minutes per sample. Throughout the course of the survey an outdoor microphone windshield was used. Noise measurements were generally made in accordance with BS7445-2:1991 'Description and measurement of environmental noise. Guide to the acquisition of data pertinent to land use'.

4.8 The noise levels were found to be consistent between measurements taken on a hand-held sound level meter and those logged at the fixed measurement position.

4.9 A large amount of noise data were gathered during the survey which is summarised in the graph and table below.

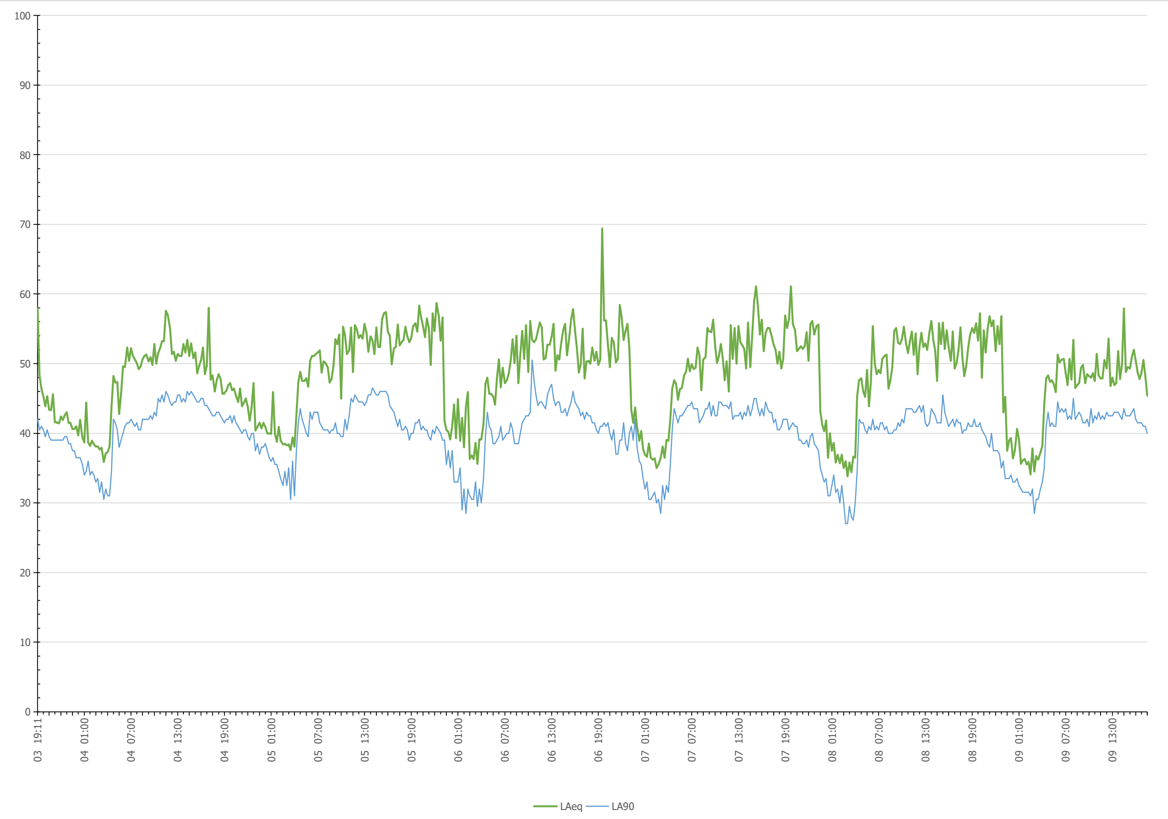

Figure 3: Continuously logged noise data at the measurement position reported in 15-minute samples

Date	Time	Location	L_{Aeq}	LC_{eq}	L_{AFMax}	L_{AF90}	$L_{Eq,63Hz}$	$L_{Eq,125Hz}$	Comments
03/05/2024	20:52	Internal level	72	75	85	68	56	64	Restaurant with 52 covers
03/05/2024	21:08	Logging position	44	55	59	36	49	43	Road traffic noise, aircraft
03/05/2024	21:17	Logging position	42	60	48	39	56	48	Traffic, aircraft, sirens
03/05/2024	22:20	Logging position	37	59	41	35	52	50	Traffic, aircraft
03/05/2024	22:26	Old Stables	45	60	55	37	49	47	Fireworks from Twickenham area, finished at 22:30
03/05/2024	23:09	Logging position	38	56	44	35	52	45	All customers left, premises closed

Figure 4: Attended measurement data and commentary. All sound pressure levels in dB re: 20μPa

4.10 The maximum number of cars in the parking area that evening was ten. I observed customers gradually leaving by car, by taxi, and on foot as the evening progressed. This process was supervised by the member of staff allocated to the car park and the process was quiet and uneventful.

4.11 By 23:09 I observed that the restaurant was empty and that all customers had left the site.

4.12 I left the site at approximately 23:20hrs and ordered an Uber which collected me at a bus stop on Petersham Road.

5.0 Assessment

5.1 The graph at Figure 3 shows continuously logged data at the measurement location close to Rose Bank. Each dip in the graph is the night-time period, with the very lowest point occurring between 03:00hrs and 04:00hrs in the morning. This is a typical noise profile for a suburban location influenced by road traffic and it is this time, in the early hours of the morning, where activity on the surrounding roads is at its lowest and hence the lowest noise levels are recorded. It is also of note that commercial aircraft noise is rare in the early hours, whereas up to around 23:30hrs at this location there is regular and noticeable aircraft noise primarily due to the Heathrow flightpath.

5.2 The first dip on the graph in Figure 3 is in the early hours of Saturday morning following the Friday night installation of the noise logging equipment and my attended survey. This is followed by dips in the graph in the early hours of Sunday morning, Monday morning, Tuesday morning, Wednesday morning and Thursday morning, with the survey eventually ending at 17:30hrs on Thursday 9th May 2024.

5.3 As can be seen the noise profile follows a very similar pattern each day of the week with no particular day, or days, dominating the survey as louder.

5.4 Further analysis of the data, summarised in Figure 5 below, shows that the average noise levels, and background noise levels, at the measurement position do not increase when the restaurant is open compared to the evenings when the restaurant is closed.

Date	**Open in evening**	**Average noise level** $L_{Aeq,\ 18:30\text{-}23:00hrs}$	**Background level** $L_{A90,\ 18:30\text{-}23:00hrs}$
Friday 3rd May 2024	**Yes**	**48**	**40**
Saturday 4th May	**Yes**	**46**	**41**
Sunday 5th May 2024	No	56	40
Monday 6th May 2024	No	58	40
Tuesday 7th May 2024	No	55	40
Wednesday 8th May	No	55	39
Thursday 9th May	Yes	*No data for evening*	*No data for evening*

Figure 5: Evening noise levels for the period 18:30 - 23:00. All sound pressure levels in dB re: 20µPa

5.5 There is one high noise incident at 19:42hrs on Monday 6th May. It is a relatively short-duration incident of and follows a spectral profile that indicates activity very close to the measurement microphone.

5.6 With this single exception, the noise profile, based on 15-minute sample periods, is consistent throughout the week. What is relevant to note is the restaurant use is not consistent: The restaurant was only open in the evenings of Friday 3rd May and Saturday 4th May, and closed on the other evenings, yet the noise profile does not show louder average noise levels on the Friday or the Saturday evenings compared to the other evenings.

Date	**Lunch service**	**Dinner service**
Friday 3rd May 2024	12:00 - 17:00	**18:30 - 23:00**
Saturday 4th May 2024	12:00 - 17:00	**18:30 - 23:00**
Sunday 5th May 2024	12:00 - 17:00	CLOSED
Monday 6th May 2024	12:00 - 17:00	CLOSED
Tuesday 7th May 2024	12:00 - 17:00	CLOSED
Wednesday 8th May 2024	12:00 - 17:00	CLOSED
Thursday 9th May 2024	12:00 - 17:00	**18:30 - 23:00**

Figure 6: Restaurant operating hours during the continuous noise survey

6.0 Conclusions

6.1 The operation of the restaurant has no impact on average noise levels at the continuous noise logging measurement location close to Rose Bank.

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Appendix A - Glossary

Sound Pressure Level and the decibel (dB)

A sound wave is a small fluctuation of atmospheric pressure. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. In order to cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. Although it might seem unusual to use a logarithmic scale to measure a physical phenomenon, it has been found that human hearing also responds to sound in an approximately logarithmic fashion. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 140 dB (threshold of pain).

Frequency and Hertz (Hz)

As well as the loudness of a sound, the frequency content of a sound is also very important. Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or hertz (Hz). Sometimes large frequency values are written as kilohertz (kHz), where 1 kHz = 1000 Hz. Young people with normal hearing can hear frequencies in the range 20 Hz to 20,000 Hz. However, the upper frequency limit gradually reduces as a person gets older.

A-weighting

The ear does not respond equally to sound at all frequencies. It is less sensitive to sound at low and very high frequencies, compared with the frequencies in between. Therefore, when measuring a sound made up of different frequencies, it is often useful to 'weight' each frequency appropriately, so that the measurement correlates better with what a person would actually hear. This is usually achieved by using an electronic filter called the 'A' weighting, which is built into sound level meters. Noise levels measured using the 'A' weighting are denoted dBA. A change of 3dBA is the minimum perceptible under normal everyday conditions, and a change of 10dBA corresponds roughly to doubling or halving the loudness of sound.

C-weighting

The C-weighting curve has a broader spectrum than the A-weighting curve and includes low frequencies (bass) so it i can be a more useful indicator of changes to bass levels in amplified music systems.

Noise Indices

When a noise level is constant and does not fluctuate over time, it can be described adequately by measuring the dB level. However, when the noise level varies with time, the measured dB level will vary as well. In this case it is therefore not possible to represent the noise level with a simple dB value. In order to describe noise where the level is continuously varying, a number of other indices are used. The indices used in this report are described below.

L_{eq} The equivalent continuous sound pressure level which is normally used to measure intermittent noise. It is defined as the equivalent steady noise level that would contain the same acoustic energy as the varying noise. Because the averaging process used is logarithmic the L_{eq} is dominated by the higher noise levels measured.

L_{Aeq} The A-weighted equivalent continuous sound pressure level. This is increasingly being used as the preferred parameter for all forms of environmental noise.

L_{Ceq} The C-weighted equivalent continuous sound pressure level includes low frequencies and is used for assessment of amplified music systems.

$L_{eq,63Hz}$ The equivalent continuous sound pressure level in the octave band centred on 63Hz. This can be considered the lower bass octave in music as it covers the frequency range of 44-88Hz.

$L_{eq,125Hz}$ The equivalent continuous sound pressure level in the octave band centred on 125Hz. This can be considered the upper bass octave in music covering the range of 88-177Hz.

L_{Amax} is the maximum A-weighted sound pressure level during the monitoring period. If fast-weighted it is averaged over 125 ms, and if slow-weighted it is averaged over 1 second. Fast weighted measurements are therefore higher for typical time-varying sources than slow-weighted measurements.

L_{A90} is the A-weighted sound pressure level exceeded for 90% of the time period. The L_{A90} is used as a measure of background noise.

Sound insulation terminology

$D_{nT,w}$ Weighted standardised level difference, a single figure generated by comparing the D_{nT} with a reference curve. The reference curve is shifted in 1dB steps until the sum of adverse deviation of the test curve, compared to the reference curve, is as large as possible, but no more than 32.0 dB. The value of the shifted reference curve at 500Hz is taken as the $D_{nT,w}$. N.B. As $D_{nT,w}$ for airborne transmission represents a level difference, an improvement generates a larger figure.

C_{tr} A 'spectrum adaptation term' used to correct the $D_{nT,w}$ in order to reflect low frequency performance of the wall or floor tested.

Appendix B - Restaurant location

Appendix C - Instrumentation

All attended measurements were carried out using a Cirrus type CR:171B integrating-averaging sound level meter with real-time 1:1 & 1:3 Octave band filters and audio recording conforming to the following standards: IEC 61672-1:2002 Class 1, IEC 60651:2001 Type 1 I, IEC 60804:2000 Type 1, IEC 61252:1993 Personal Sound Exposure Meters, ANSI S1.4-1983 (R2006), ANSI S1.43-1997 (R2007), ANSI S1.25:1991. 1:1 & 1:3 Octave Band Filters to IEC 61260 & ANSI S1.11-2004.

Unattended measurements were carried out using a Casella type CEL-633C1 integrating-averaging sound level meter with real-time 1:1 & 1:3 octave band filters conforming to the following standards: IEC 61672-1:2013 Class 1, IEC 60651:1979 Type 1, IEC 60804:2000 Type 1, ANSI S1.4-1983, ANSI S1.43-1997 (R2007). 1:1 & 1:3 octave band filters comply with EN 61260:1996, Class 0 & ANSI S1.11-1986, Order-3 Type 0C.

Description	
Cirrus sound level meter	type CR:171B
Cirrus pre-polarized free-field microphone	type MK:224
Cirrus microphone pre-amplifier	type MV:200E
Cirrus class 1 acoustic calibrator	type CR:515
Casella sound level meter	type CEL-633C1
Casella pre-polarized free-field microphone	type CEL-251
Casella microphone pre-amplifier	type CEL-495
Casella class 1 acoustic calibrator	type CEL-110/1

The calibration of the measuring equipment was checked prior to and immediately following the tests and no signal variation occurred. The calibration of equipment is traceable to national standards.

Appendix D - Meteorology

Date	Temperature/°C	Wind speed (avg)/ ms^{-1}	Precipitation/mm
Friday 3rd May 2024	9 - 13	5	3.6
Saturday 4th May 2024	8 - 17	2	none
Sunday 5th May 2024	7 - 17	2	none
Monday 6th May 2024	9 - 14	2	3.0
Tuesday 7th May 2024	10 - 19	3	none
Wednesday 8th May 2024	9 - 21	2	none
Thursday 9th May 2024	10 - 23	2	none