# 1-11A Swain's Lane and 109-110 Highgate West Hill

## The Earl of Listowel

## Environmental Noise Report

Cundall

October 2013

CUNDALL

# The Earl of Listowel

## Swain's Lane, Camden

## Environmental Noise Report

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| Job No: | 1005586 |
| Doc No: | 1005586-RPT-00001 |
| Latest Revision: | C |
| Date: | 7/10/2013 |

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|---|---|---|
| **Project name** | Swains Lane, Camden | **Job Number** |
| **Report Name** | Environmental Noise Report | 1005586 |

## Document Revision History

| Revision Ref | Issue Date | Purpose of issue / description of revision |
|---|---|---|
| - | 10/07/2012 | Planning |
| A | 18/09/201 | Planning |
| B | 24/09/2013 | Planning |
| | | |
| | | |
| | | |
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## Document Validation (latest issue)

| Revision | Issue Date | Purpose of issue / description of revision / version | | | |
|---|---|---|---|---|---|
| C | 7/10/2013 | Planning | | | |
| | | | Prepared by | Checked by | Approved by |
| | | Name | TN | | |
| | | Signature | | | |

# Contents

# 1. Executive Summary

Proposals are to build a mixed use development, comprising retail at ground floor with residential above, on the corner of Swain's Lane and Highgate West Hill.

This Report documents measured noise levels around the site. These measurements have been used to determine the noise impact on the proposed building, in order to specify glazing and ventilation attenuation requirements to meet with British Standard internal noise criteria.

The following Table summarises the glazing and ventilation attenuation requirements:

| Attenuation requirement | Glazing solution | Ventilation solution |
|---|---|---|
| Glazing 39 dB $R_w + C_{tr}$<br>Ventilation 45 dB $D_{n,e,w} + C_{tr}$ | • 8.8 mm Pilkington Optiphon<br>• 16 mm air gap<br>• 12.8 mm Pilkington Optiphon | Whole house ventilation system |
| Glazing 34 dB $R_w + C_{tr}$<br>Ventilation 40 dB $D_{n,e,w} + C_{tr}$ | • 8.8 mm Pilkington Optiphon<br>• 16 mm air gap<br>• 6 mm pane | Acoustic trickle vents |
| Glazing 26 dB $R_w + C_{tr}$<br>Ventilation 32 dB $D_{n,e,w} + C_{tr}$ | • 6 mm pane<br>• 16 mm air gap<br>• 6 mm pane | Trickle vents |

**Table 1 – Glazing and ventilation solutions**

To protect residential dwellings from noise transfer from ground floor retail units, dividing floors between retail and residential demises should achieve at least 60 dB $D_{nT,w}$ / 55 dB $D_{nT,w} + C_{tr}$.

Limiting noise levels for services plant have been specified, based on criteria set out in DP28. Noise from services plant should not exceed 31 dBA at 1 m external to a sensitive façade (existing or proposed). If it is considered that the noise is to have a distinguishable discrete continuous note, or to be impulsive in nature, the noise impact should be not greater than 26 dBA.

# 2. Introduction

Cundall Acoustics has been instructed by The Earl of Listowel (Lord Listowel) to carry out a noise survey and assessment for a proposed mixed use development on the corner of Swain's Lane and Highgate West Hill, Camden, London.

The site currently has nine, single-storey shop/café units with garages and a car valeting business behind. The proposals are to demolish the existing building and develop a mixed use scheme comprising retail at ground floor with residential above.

The purpose of this Report is to document the existing noise climate, to determine the noise exposure on the site and prescribe appropriate glazing and ventilation solutions and to set limiting noise levels for services plant. The assessment criteria is based on Camden Development Policy 28: Noise and vibration which prescribes the criteria to achieve the planning strategy and policies set out within the Core Strategy.

# 3. Assessment Criteria

Camden Development Policies form part of the Council's Local Development Framework. The Core Strategy sets out the key elements of the Council's planning vision. Core Strategy Policy 5 (CS5): 'Managing the impact of growth and development' acknowledges that protecting amenity is '..a key part of successfully managing growth in Camden', and the approach to the specific issue of noise and vibration is contained within Development Policies, policy DP28.

Policy DP28 requires an assessment to be made in compliance with PPG24: Planning and Noise. In March 2012, PPG24 was withdrawn and replaced by the National Planning Policy Framework, however, the Noise Exposure Categories prescribed within PPG24 were considered a suitable screening exercise and form the basis of Camden's policy DP28.

As a mixed use development, this Report addresses existing noise impact on proposed sensitive receptors and the potential noise impact from the development on existing and proposed sensitive receptors. The following Tables are taken from Policy DP28.

Table A: Noise levels on residential sites adjoining railways and roads at which planning permission will not be granted.

| Noise description and location of measurement | Period | Time | Sites adjoining railways | Sites adjoining roads |
|---|---|---|---|---|
| Noise at 1 m external to a sensitive façade | Day | 07:00 to 19:00 | 74 dB $L_{Aeq,12h}$ | 72 dB $L_{Aeq,12h}$ |
| | Evening | 19:00 to 23:00 | 74 dB $L_{Aeq,4h}$ | 72 dB $L_{Aeq,12h}$ |
| | Night | 23:00 to 07:00 | 66 dB $L_{Aeq,8h}$ | 66 dB $L_{Aeq,12h}$ |

**Table 2 – Reproduction of DP28, Table A**

Table B: Noise levels on residential streets adjoining railways and roads at and above which attenuation measures will be required.

| Noise description and location of measurement | Period | Time | Sites adjoining railways | Sites adjoining roads |
|---|---|---|---|---|
| Noise at 1 m external to a sensitive façade | Day | 07:00 to 19:00 | 65 dB $L_{Aeq,12h}$ | 62 dB $L_{Aeq,12h}$ |
| | Evening | 19:00 to 23:00 | 60 dB $L_{Aeq,4h}$ | 57 dB $L_{Aeq,12h}$ |
| | Night | 23:00 to 07:00 | 55 dB $L_{Aeq,8h}$ | 52 dB $L_{Aeq,12h}$ |
| Individual noise events several times an hour | Night | 23:00 to 07:00 | >82 dB $L_{Amax}$ (S time weighting) | >82 dB $L_{Amax}$ (S time weighting) |

**Table 3 – Reproduction of DP28, Table B**

Table E: Noise levels from plant and machinery at which planning permission will not be granted.

| Noise description and location of measurement | Period | Time | Noise level |
|---|---|---|---|
| Noise at 1 m external to a sensitive façade | Day, evening and night | 00:00 to 24:00 | 5 dBA $<L_{A90}$ |
| Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 m external to a sensitive façade | Day, evening and night | 00:00 to 24:00 | 10 dBA $<L_{A90}$ |
| Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 m external to a sensitive façade | Day, evening and night | 00:00 to 24:00 | 10 dBA $<L_{A90}$ |
| Noise at 1 m external to sensitive façade where $L_{A90}$ >60 dB | Day, evening and night | 00:00 to 24:00 | 55 dBA $L_{Aeq}$ |

**Table 4 – Reproduction of DP28, Table B**

# 4. Site description

The site is located on the corner of Highgate West Hill and Swain's Lane in the London Borough of Camden. The intersection between these two roads is formed by a mini-roundabout.

Both Swain's Lane and Highgate West Hill are busy suburban roads. Traffic volume increases significantly during rush hour periods.

Both roads are also major bus routes (including for example routes 214 and C2). During rush hour periods, buses run every 6-10 minutes. During the night-time period typically between 3-6 buses per hour were recorded.

The site is located within a predominantly residential area. However, the section of Swain's Lane near the site has a number of small retail premises at ground floor with residential above. Opposite the site, over Swain's Lane is the Carob Tree Greek Mediterranean Restaurant.

During attended surveys, there was some noticeable noise from existing services plant, however, the dominant noise source was road traffic.

# 5. Noise surveys

The site was not deemed sufficiently secure for unattended monitoring, therefore attended noise surveys were carried out during daytime and night-time periods.

Surveys were carried out during the following time periods:

- 26th June 2012 between 16:15 and 20:00 hours
- 27th June 2012 between midnight and 03:45 hours
- 27th June 2012 between 10:15 and 13:45 hours.

Despite the survey being undertaken in June 2012, it is considered that the measurement data should still be applicable to the current conditions, and no significant changes will have taken place.

The following figure shows approximate location of monitoring positions. Each monitoring position was at 1.5 m above ground level and at least 1.5 m from the nearest building façade. Positions 1 & 2 were chosen to represent the noise impact on the site from the dominant noise source, road traffic, with Position 3 used to determine the background noise levels.

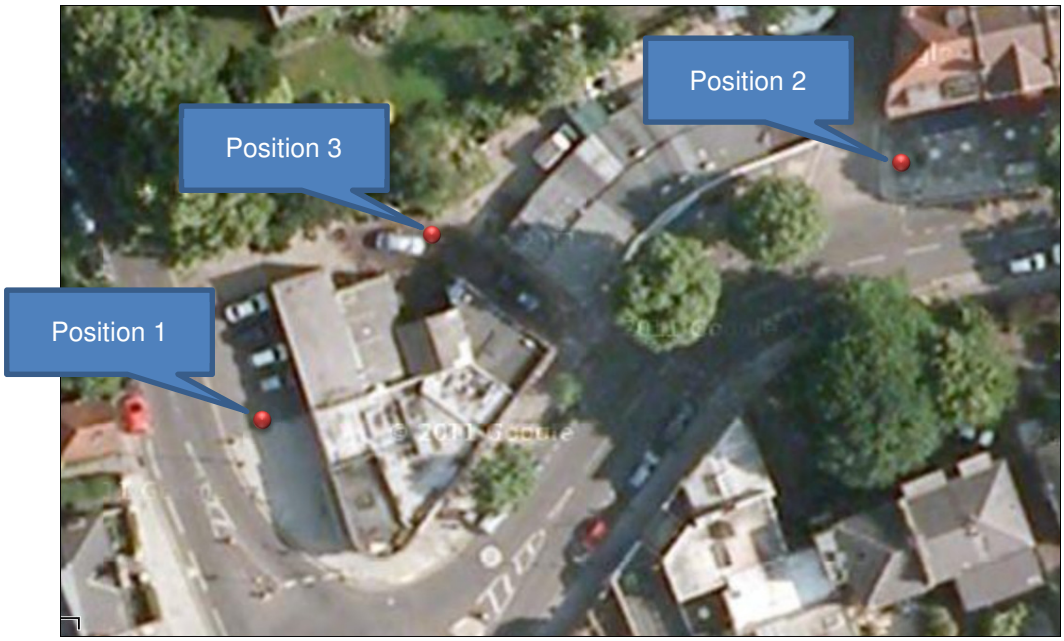


**Figure 1 – Indicative location of monitoring positions**

Noise monitoring was carried out using a Casella CEL 633C, serial number 1211405, UKAS calibrated (Cert. no. 4635) 24th March 2011.

The meter was calibrated prior to and immediately after measurements were made using a CEL 110/1 acoustic calibrator, Serial no. 080610. No significant drift was noted. Copies of relevant calibration certificates are available upon request.

Weather conditions during the surveys were overcast, but dry with little wind (typically 0.5 to 3.5 m/s).

Measurements were made sequentially of various noise descriptors, but the key ones used in this assessment are as follows:

- $L_{Amax}$ – the maximum A-weighted noise level within the measurement time period, *T*
- $L_{Aeq,T}$ – the average A-weighted noise level exposure over a given time period, *T*
- $L_{A90,T}$ – the A-weighted noise level exceeded for 90% of the measurement period, *T*, described in BS 4142 as the background noise level

The time period, *T*, was set to record simultaneously in 5 and 15 minute increments for the duration of surveys.

A summary of measurement results is shown in Table 5 below.

| Period | Position | $L_{ASmax}$ | Averaged $L_{Aeq,T}$ | Lowest $L_{A90,T}$ |
|---|---|---|---|---|
| Daytime | 1 | 89.4 | 68.2 | 57.0 |
| | 2 | 82.6 | 64.0 | 52.0 |
| Evening | 1 | 89.2 | 68.6 | 58.0 |
| Night-time | 1 | 77.5 | 62.2 | 36.0 |
| | 2 | 75.5 | 49.9 | 40.0 |
| | 3 | 69.9 | 50.5 | 35.5 |

**Table 5 – Summary of measurement results**

# 6. Noise impact on the site

This Section details the assessment of noise impact on the proposed site and mitigation measures required to meet with Local Authority internal noise criteria.

## 6.1 Noise levels

Section 5 above shows the measured noise levels around the site. As detailed above, the dominant noise source to affect the site is road traffic on Swain's Lane and Highgate West Hill.

Tables A and B of policy DP28 specify the noise levels at which planning will not be granted, and at which attenuation measures will be required. These are summarised in the following Tables. This assessment is only concerned with road traffic noise affecting the site as there are no nearby rail lines or tube lines.

### 6.1.1 Position 1 – Highgate West Hill

| Noise description and location of measurement | Period | Noise levels above which planning will not be granted | Noise levels above which attenuation measures will be required | Measured noise levels (Position 1) |
|---|---|---|---|---|
| Noise at 1 m external to a sensitive façade | Day | 72 dB $L_{Aeq,12h}$ | 62 dB $L_{Aeq,12h}$ | 68.2 dB $L_{Aeq,T}$ |
| | Evening | 72 dB $L_{Aeq,12h}$ | 57 dB $L_{Aeq,12h}$ | 68.6 dB $L_{Aeq,T}$ |
| | Night | 66 dB $L_{Aeq,12h}$ | 52 dB $L_{Aeq,12h}$ | 62.2 dB $L_{Aeq,T}$ |
| Individual noise events several times an hour | Night | N/A | >82 dB $L_{ASmax}$ | 77.5 dB $L_{ASmax}$ |

Table 6 – Summary of Local Authority criteria and measured noise levels

It can be seen that measured noise levels during daytime, evening and night-time periods all fall below the maximum threshold at which noise would result in planning not being granted. However, the average noise levels do exceed the minimum levels specified, and therefore specific attenuation measures to control noise break-in will be required.

The maximum instantaneous noise levels ('S' weighting) do not exceed the criterion of 82 dB $L_{ASmax}$.

### 6.1.2 Position 2 – Swain's Lane

| Noise description and location of measurement | Period | Noise levels above which planning will not be granted | Noise levels above which attenuation measures will be required | Measured noise levels (Position 2) |
|---|---|---|---|---|
| Noise at 1 m external to a sensitive façade | Day | 72 dB $L_{Aeq,12h}$ | 62 dB $L_{Aeq,12h}$ | 64.0 dB $L_{Aeq,T}$ |
| | Evening | 72 dB $L_{Aeq,12h}$ | 57 dB $L_{Aeq,12h}$ | - |
| | Night | 66 dB $L_{Aeq,12h}$ | 52 dB $L_{Aeq,12h}$ | 49.9 dB $L_{Aeq,T}$ |
| Individual noise events several times an hour | Night | N/A | >82 dB $L_{ASmax}$ | 75.5 dB $L_{ASmax}$ |

Table 7 – Summary of Local Authority criteria and measured noise levels

Data is not available for the evening period at Position 2. It has therefore been assumed that the noise impact during the evening period would be similar to the daytime period, which should be a worst-case assumption. From measurement data at Position 2, it is clear that noise affecting the site should not prohibit development, but specific attenuation measures will be required to reduce break-in noise.

The maximum instantaneous noise levels ('S' weighting) do not exceed the criterion of 82 dB $L_{ASmax}$.

## 6.2 Attenuation measures

A comparison of measured noise levels affecting the site, compared to Camden's policy DP28, show that specific attenuation measures will be required to control noise break-in.

Camden's noise policy does not detail specific internal noise criteria and therefore this report is to be based on best practice, as set out within BS 8233:1999.

The following Table summarises the guidelines for internal noise levels within residential dwellings. BS 8233 guidelines were based on the information provided in the World Health Organisations Community Guidelines.

| Criterion | Typical situation | Design Range $L_{Aeq,T}$ / dB | |
|---|---|---|---|
| | | Good | Reasonable |
| Reasonable resting / sleeping conditions | Living rooms | 30 | 40 |
| | Bedrooms | 30 | 35 |

Table 8 – Summary of internal noise criterion from BS 8233:1999

Based on achieving the 'good' criteria above during daytime, evening and night-time periods, the following Table shows the calculation process to determine the glazing attenuation required. The ventilation attenuation requirements is based on 6 dB above the glazing attenuation.

| Façade | Measured noise impact* | Internal noise criteria | Glazing attenuation | Ventilation attenuation |
|---|---|---|---|---|
| Highgate West Hill | 68.6 dB $L_{Aeq,T}$ | 30 dB $L_{Aeq,T}$ | 39 dB $R_w + C_{tr}$ | 45 dB $D_{n,e,w} + C_{tr}$ |
| Swain's Lane | 64.0 dB $L_{Aeq,T}$ | 30 dB $L_{Aeq,T}$ | 34 dB $R_w + C_{tr}$ | 40 dB $D_{n,e,w} + C_{tr}$ |

**Table 9 – Calculation of glazing and ventilation attenuation requirements**

*Note: the quoted noise impact is the highest average noise level from either the daytime, evening or night-time periods.

It is considered that façades that do not have a direct line of sight to road transport could be fitted with standard thermal double glazing (i.e. ≥ 26 dB $R_w + C_{tr}$).

The following Figure shows the glazing attenuation for each façade.

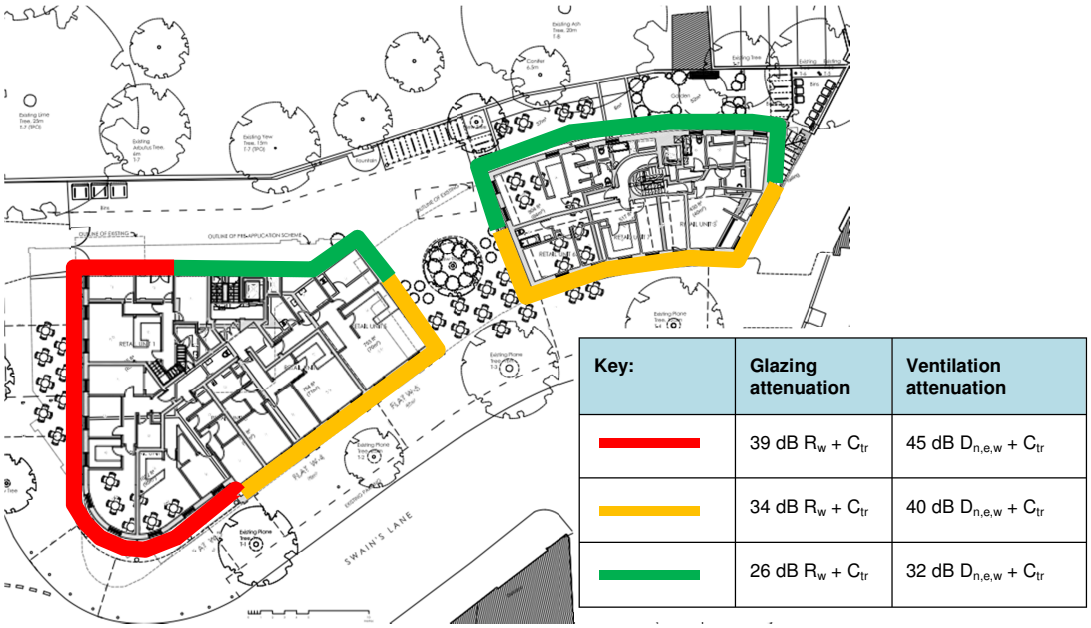


**Figure 2 – Glazing and ventilation attenuation requirements**

## 6.3 Suggested glazing and ventilation solutions

The following Table shows suggested glazing and ventilation solutions to meet with the attenuation requirements:

| Attenuation requirement | Suggested glazing solution | Suggested ventilation solution |
|---|---|---|
| Glazing 39 dB $R_w + C_{tr}$<br>Ventilation 45 dB $D_{n,e,w} + C_{tr}$ | • 8.8 mm Pilkington Optiphon<br>• 16 mm air gap<br>• 12.8 mm Pilkington Optiphon | Whole house ventilation system |
| Glazing 34 dB $R_w + C_{tr}$<br>Ventilation 40 dB $D_{n,e,w} + C_{tr}$ | • 8.8 mm Pilkington Optiphon<br>• 16 mm air gap<br>• 6 mm pane | Acoustic trickle vents |
| Glazing 26 dB $R_w + C_{tr}$<br>Ventilation 32 dB $D_{n,e,w} + C_{tr}$ | • 6 mm pane<br>• 16 mm air gap<br>• 6 mm pane | Trickle vents |

Table 10 – Glazing and ventilation solutions

# 7. Noise from Ground floor retail

Generally, retail accommodation does not generate high noise levels. However, it is considered prudent to provide a higher level of sound attenuation between ground floor retail units and first floor residential.

It is recommended that dividing floors between retail and residential demises should achieve at least 60 dB $D_{nT,w}$ / 55 dB $D_{nT,w} + C_{tr}$. In context, this is 10 dB greater than the minimum requirements set out in Building Regulations Approved Document E.

It is recommended that noise levels within tenancies need to be limited to 80 dB $L_{Aeq,10mins}$ and 90 dB $L_{Amax}$ during normal operation. It will be the responsibility of the tenant to monitor their operational noise levels and, where necessary, carry out remedial measures to their operational procedures or the building fabric, such that the equivalent transmitted noise level for these set of criteria are not exceeded in residential dwellings. Appropriate wording will need to be written into the Agreement to Lease for each tenancy.

In order to minimise the possibility of noise flanking via shop frontages, it is recommended that and glazed shop fronts achieve a minimum laboratory rated sound insulation of 38 dB $R_w + C_{tr}$.

# 8. Services plant noise

The following Table shows the criteria for new items of services plant (ref. Table E, DP28):

| Noise description and location of measurement | Period | Time | Noise level |
|---|---|---|---|
| Noise at 1 m external to a sensitive façade | Day, evening and night | 00:00 to 24:00 | 5 dBA $<L_{A90}$ |
| Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 m external to a sensitive façade | Day, evening and night | 00:00 to 24:00 | 10 dBA $<L_{A90}$ |
| Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 m external to a sensitive façade | Day, evening and night | 00:00 to 24:00 | 10 dBA $<L_{A90}$ |
| Noise at 1 m external to sensitive façade where $L_{A90}$ >60 dB | Day, evening and night | 00:00 to 24:00 | 55 dBA $L_{Aeq}$ |

**Table 11 – Reproduction of DP28, Table B**

The lowest background noise levels were measured at Position 3, i.e. to the rear of the development, shielded from direct road traffic noise. The lowest measured $L_{A90,T}$ was 35.5 dBA.

Based on the above noise criteria, it is therefore considered that noise from services plant should not exceed 31 dBA at 1 m external to a sensitive façade (existing or proposed). If it is considered that the noise is to have a distinguishable discrete continuous tone, or to be impulsive in nature, the noise impact should be not greater than 26 dBA.

It should be noted that this is the combined noise level of all plant running simultaneously, and therefore during the design stage where more detailed information is available, these limiting noise levels will need to be split for each tenancy.

At this stage, operators are unknown, however separate planning applications will be submitted if necessary.

# 9. Demolition and construction noise

During the construction period, some disturbance is inevitable. However noise from site activity is likely to reduce towards the end of the construction phase, as internal works and fit-out are inherently less obtrusive.

The Contractor will be required to comply with the requirements of BS 5228-1: 2009 'Code of practice for noise and vibration control on construction and open sites – Part 1 Noise'.

## 9.1 Good practice guidance

The following is considered good practice guidance for the management of construction noise and vibration:

- Effective communication between the main contractor and nearby noise sensitive receptors (residential and commercial) outlining current and forthcoming activities, including timescales. For a development of this scale, a 'point of contact' with dedicated phone number and email address should be made available for queries and complaints. Effective communication is important in controlling adverse community reaction to noise;
- Liaison with local residents to encourage a positive attitude in the community;
- Appropriate hours of noisy work, particularly adjacent to residential dwellings should be restricted;
- Site vehicles should not be left idling, particularly when in close proximity to residential dwellings. This is also applicable to other site machinery, such as pumps, generators etc, which, if not in use, should be shut down;
- Over-revving of works vehicles should be avoided and site access should be configured to minimise disruption;
- Site hoarding should be installed to provide barrier attenuation against noise. To be effective, the barrier should block the line of sight between the noise source and receptor, and screens are more effective closer to the noise source. Site hoarding can also be used as an effective communication tool if details of the construction programme and activities are placed on the hoarding. Transparent screens can be used to allow a visual appreciation of on-going works;
- Careful selection of plant and machinery should be made to minimise noise impact and all items of plant and machinery should be well maintained in accordance with the manufacturer's instructions. Where feasible, appropriate silencers should be used to reduce noise levels at source;
- Constant monitoring of activities and noise levels around the site will be required to identify areas where any additional mitigation measures could be employed;

- Careful consideration will be required to the use of heavy equipment, particularly piling equipment to reduce vibration impact on nearby persons, such as auger driven piling as opposed to impact piling, where feasible.

# 10. Conclusions

An assessment has been made of the acoustic issues for a proposed mixed use development.

Glazing and ventilation attenuation measures have been specified to protect residential areas from road traffic noise. A minimum airborne sound insulation value has also been specified to minimise noise transfer into residential dwellings from ground floor retail units.

Limiting noise levels have been specified to see that noise from new items of services plant does not impact adversely on existing and/or proposed noise sensitive receptors.

**1-11A Swain's Lane and 109-110 Highgate West Hill**
**Client:** The Earl of Listowel