ACOUSTIC REPORT

SHARPS REDMORE PARTNERSHIP

ACOUSTIC CONSULTANTS

Mr. C. Matson,
Rybka,
10 Lindsey Street,
London.
EC1A 9HP.

4th February 2005

By e-mail and post

Dear Mr. Matson,

Ref: 125 High Holborn.
Project No: 03727.

I have inspected the revised architectural layouts and sections for the building and have considered the potential impact on the assessment of plant noise control as detailed in our report dated 29th August 2001.

From the drawings it can be seen that the roof is now lower than in the previous scheme and is now at a similar height to the roofs of some of the neighbouring buildings, instead of being slightly higher than some of these buildings. This does mean that there is likely to be slightly less screening of noise from plant on the roof being transmitted to the nearby buildings, although the effect should only be marginal provided there is no direct line of sight from these nearby buildings to the plant. I, also, understand that some of the plant that was previously to be on the roof will now be in the basement with coolers on the roof, which should lead to quieter plant outside the building, whilst attenuation can be fitted to any ventilation openings/systems from the basement plantrooms.

Based on this the guidance in our report dated 29th August 2001 in relation to the plant noise where we give criteria for noise levels due to plant at neighbouring buildings remains the same and noise control will be provided on this basis. The noise levels stated are consistent with Camden's normal requirements (unless they have changed recently) and the report should be appropriate to accompany the planning application.

I hope this adequately covers the situation however should you wish to discuss any aspects further, please contact me.

Yours sincerely.

T. L. Redmore.

ENVIRONMENTAL NOISE SURVEY REPORT,
WITH RECOMMENDATIONS FOR
FACADE SOUND INSULATION
AND PLANT NOISE CONTROL AT
125 HIGH HOLBORN,
LONDON

Project No: 013727

Report prepared by:
M. Jones,
BSc (HONS), AMIOA
Acoustic Consultant
Sharps Redmore Partnership,
The White House,
London Road,
Copdock,
Ipswich IP8 3JH

Tel: 01473 730075
Fax: 01473 730030

29th August 2001

1.0 Introduction

1.1 The Sharps Redmore Partnership (SRP) has been instructed by Rybka, to undertake an assessment of the existing environmental noise climate surrounding the existing building at 125 High Holborn, London.

1.2 The development of the site will tie in several different buildings owned by the same landlord, into a single modern office building, with retail units occupying areas at ground and basement level.

1.3 Noise data recorded during the day (L_{Aeq}) will be used to determine the sound insulation performance required of the building facades. Background (L_{A90}) levels recorded at the rear of the site away from directly incident traffic noise during the night will be used to determine limiting noise levels for mechanical services plant serving the new building.

1.4 The limiting noise specification will be given to satisfy the requirements of the local planning authority, London Borough of Camden, and will result in a marginal local increase (1 dBA) relative to the lowest measured L_{A90} level at the nearest residential properties.

1.5 High Holborn, Southampton Row and Southampton Place border the existing site with these facades forming a large sheltered courtyard arrangement. The new building is to extend up to 6th floor level (up to two floors higher than current), but will be just 15 metres horizontally from the nearest residential dwelling, located to the rear. Plant to serve the new building will be located mainly at basement level with roof level fresh air intakes and ground floor air discharges. Chillers and some ancillary fan systems are also to be located centrally at roof level. A roof plan is given as Figure 1 to indicate measurement locations, (some of which were lower down the building), this also highlights the proposed plant location.

1.6 Noise levels recorded at the rear of the site have been determined by cooling plant (temporary and fixed) which appeared to be on every building within the large courtyard type arrangement. Noise was also due to construction work currently being carried out on the British museum, which can be seen from the rear of the site.

2.0 Survey Method and Equipment

2.1 Method

2.1.1 Daytime measurements

Noise from Southampton Row is responsible for the highest levels incident on the proposed building. High Holborn also has high noise levels, however these are slightly lower at 4th floor level.

A site plan is shown as Figure 1 for information, detailing the measurement locations.

The rear of the site forms a courtyard arrangement with 4-5 floor buildings extending around to border all adjoining roads. Almost all buildings within the rear courtyard area have ground floor areas extending into the centre and at the time of the survey, most properties had cooling equipment, temporary or permanently fixed, in operation. This includes 125 High Holborn.

Ambient noise levels in terms of octave band levels were recorded at locations all around the noisy façade at 2nd floor level, to determine any differences in incident levels and allow the accurate calculation of façade sound insulation requirements.

Octave band measurements were also taken at the rear of the site (4th floor level), as it was anticipated that this area would require a significantly lower sound insulation specification.

2.1.2 Night Measurements

Broadband background and ambient noise levels where recorded continuously at the rear of the site, on a flat roof at 4th floor level.

Windows of residential dwellings were noted, also at fourth floor level, located just 15 metres from the rear of the existing building. It is considered that this location will form the basis for the assessment of noise from new plant systems at roof level.

2.1.3 Measurement parameters

The following parameters were measured over typically 15-minute samples at the rear of the site: L_{A90}, L_{A10} and L_{Aeq}. These are defined below for information:

L_{90} is the level exceeded for 90% of the time. The L_{90} level is often referred to as the background noise level.

L_{10} is the level exceeded for 10% of the time and is predominantly used to assess road traffic noise.

L_{eq} is the equivalent continuous noise level over the measurement period. This is often referred to as the 'average' or 'ambient' noise level and is used to assess many types of environmental noise.

dBA (shown as suffix 'A', in parameters above) refers to the A-weighted sound level. The A-weighting is a series of filters applied to the sound level meter to mirror the response of the human ear, which is more sensitive to high frequencies than low.

2.2 Equipment

- Bruel and Kjaer precision grade sound level meter, with sequential 1:1 octave capability, type: **2260** Serial No: 1849644.
- Bruel and Kjaer precision grade sound level meter, with sequential 1:1 octave capability, type: **2238** – Mediator. Serial No.: 2160418
- Bruel and Kjaer calibrator type: 4231. Serial No: 2123045

The sound level meter was calibrated before and after the survey. No appreciable drift was noted between the two readings.

3.0 Environmental Noise Criteria

3.1 *Mechanical Services Plant Noise*

3.1.1 The local planning authority, Camden Planning services, have a standard design practice, to set Limiting noise criteria in order to achieve a minimal (-) dB) increase on the local background level

3.2 A design figure of 5 dB below the lowest pre-existing L_{90} has been used to achieve this.

3.3 New plant is to be at basement level with cooling plant, fresh air intakes and ancillary fan systems located on the roof of the building. The environmental noise criteria are to be met at 1 metre from the nearest residential window to the plant areas.

3.4 In considering noise control requirements, the number of plant items, distance to sensitive facades and reflection effects must be evaluated, along with the likely hours of operation throughout the day and/or night.

3.2 *Façade Sound Insulation*

3.2.1 The design of the building facade and the selection of a suitable glazing system are necessary to achieve the control of traffic noise into a building.

3.2.2 The following internal spectrum has been extensively used as a practical, cost-effective design for commercial office situations.

Frequency Hz	63	125	250	500	1k	2k	4k	Hz
Internal Spectrum NR 35 – L_{eq}	63	52	45	39	35	32	30	dB

Please Note. NR 35 as an internal L_{eq} traffic level is suitable to an internal services design, also of NR35 to provide an overall office floor noise level of NR38, a widely used criterion for modern office developments

4.0 Noise Survey Results

4.1 The environmental noise results recorded on the 4th floor roof of the existing building are given as Appendix 1.

4.2 The results have also been illustrated in chart form this is given as Figure 2.

4.3 The results of the octave band sample measurements are provided as Appendix 1a

4.4 A roof plan indicating the measurement locations (some of which were lower down the building) is provided as figure 3, for information.

5.0 Limiting Plant Noise Criteria

5.1 The figures below are given to control external plant noise. They are given on the basis of two scenarios; (1) that the building will operate during typical daytime office hours only; (2) that 24-hour operation is required.

Daytime Only Operation

Daytime Only Operation	0700 - 2000 hrs
Limiting Plant Noise Level (L_{Aeq})	47 dBA

24 Hour Operation

24 Hour Operation.	
Limiting Plant Noise Level (L_{Aeq})	46 dBA

5.2 The limiting levels above have been derived from our continuous measurement results obtained at the rear of the building, following the standard design practice at Camden Planning Services. The above levels represent the total allowable plant noise output from the building and should be achieved at 1 metre from the nearest affected residential window.

6.0 Glazing Specification

6.1 For new buildings it is necessary to set a glazing specification, which allows competitive tenders to be sought. The specifications below are given to reflect the fact that most of the current masonry façade is to be retained by order and that the glazing offers the only significant transfer path for external traffic noise into the building.

6.2 The sound insulation values below have been calculated based on typical glazing areas estimated whilst on site. A specification is also given to control noise ingress via the curtain wall areas of the new building.

6.3 Potential suppliers of the facade glazing system should have test data in accordance with BS EN ISO 140/3, 1995 *"Laboratory Measurement of Airborne Sound Insulation of Building Elements"*. Tests must relate to the product on offer for this development, including all framing, seals etc. Copies of test certificates to be forwarded for comment. The following Sound Reduction Indices are specified in octave bands and proposals must allow the values to be equalled or exceeded using the proposed glazing system for all octaves.

Glazing Requirements

SRI - Octave Band Centre Frequency (Hz)	63	125	250	500	1k	2k	4k	Hz
Front Façade (retained masonry)	20	25	27	32	35	36	33	dB
Front Façade (Curtain Walling)	21	26	27	33	36	38	35	dB
Rear Façade	10	18	20	25	28	30	27	dB

6.3 The curtain walling specification above, assumes basically full height glazing to the office floors, any non-vision panelling as often provided between suspended ceiling and floor level above, must provide at least the same performance as the glazing. SRP would be pleased to comment on such areas as required. The above specification could typically be achieved using a 10-12-6 double glazing configuration

6.4 For the front façade incorporating the retained masonry, the specification above could typically be met, also using a 10-12-6 double glazing construction.

6.5 The rear of the site is significantly screened from the nearby traffic routes and is therefore much quieter: as a result the specification set above can be typically achieved using a 6-12-6 glazing construction. This specification is also applicable to windows located within lightwells shown around the building.

7.0 Conclusions

7.1 Sharps Redmore have undertaken a site noise survey to determine typical environmental noise levels during the day and night time periods. Full survey results are provided at the end of this report as Appendix 1 and 1a.

7.2 Guidance has been provided regarding the limitation of plant noise from the roof of the building

7.3 Two limiting noise criteria have been provided to allow for different operational requirements, however attenuation assessment from all systems will be required when the type, location and noise levels of the plant items are known.

7.4 Glazing specifications are provided for the retained masonry façade at the front of the building, new curtain walling sections and the much quieter rear facade of the building. It is considered that thermal double glazing units of varying configurations can be used to achieve the specified noise criterion throughout.