

**TK MAXX,  
CHARING CROSS  
ROAD, LONDON**

**M&E NOISE  
IMPACT  
ASSESSMENT  
REPORT**

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**M&E NOISE IMPACT ASSESSMENT REPORT**

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**AUDIT SHEET**

REVISION	DESCRIPTION	DATE	ISSUED BY	REVIEWED BY
1	M&E Noise Impact Assessment Report	14/04/10	CC	BD

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## 1. INTRODUCTION

Hoare Lea Acoustics have been commissioned to undertake an assessment of the effect that the installation of new externally located M&E plant associated with the creation of a new TK Maxx store in Charing Cross Road, London, will have on local environmental noise conditions and the associated impact on the neighbouring community.

A survey has been undertaken to establish the existing background noise levels at the nearest noise sensitive location and determine sound levels generated by the new plant. The purpose of this assessment is to provide technical information regarding control of noise from externally located mechanical plant in support of the application for planning permission.

The report firstly offers a description of the site and identifies surrounding noise sensitive areas. The basis of the assessment is then discussed with reference to the Westminster City Council Noise Policy. The findings of the survey are then presented, including both qualitative observations and analysis of objective measurement data. On the basis of the evidence obtained, criteria are proposed which will limit the impact of the noise on the surrounding area.

A glossary of acoustical terms used throughout the report has been provided in Appendix A and details of the survey are presented in Appendix B.

## 2. SITE DESCRIPTION

The site in question is located at 118 -124 Charing Cross Road. Denmark Street is to the north of the site and a backyard area can be found at east of the site, as shown in Figure 1. This area is predominantly a busy commercial area. The buildings surrounding the site are mainly commercial/office buildings. The nearest residential building is marked in blue in Figure 1.

Figure 1: Development site and its surrounding area (source: Google Earth)



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## 3. BASIS OF ASSESSMENT

The City of Westminster requires under Policy ENV 6 that the development must include sufficient design and operational measures to minimise emission of noise to protect surrounding noise sensitive properties. It is understood from the City of Westminster Unitary Development Plan (UDP) that the noise emission standards of Table 1 should be achieved.

Table 1. City of Westminster standard noise criteria

Existing environmental noise conditions	Design requirement / Assessment Criteria
Where the existing external noise level exceeds World Health Organisation (WHO) Guideline levels of  $L_{Aeq,12hrs}$ 55 dB daytime (07.00- 19.00); $L_{Aeq,4hrs}$ 50 dB evening (19.00-23.00); $L_{Aeq,8hrs}$ 45 dB night-time (23.00- 07.00):	Maximum emission level ( $L_{Aeq,15min}$ ) should not exceed 10 dB below the minimum external background noise at the nearest noise sensitive properties.
Where the external background noise level does not exceed the above WHO Guideline levels:	Maximum emission level ( $L_{Aeq,15min}$ ) should not exceed 5 dB below the minimum external background noise level at the nearest noise sensitive properties.

Additionally, it is stated that where noise emitted from the development will contain tones or will be intermittent sufficient to attract attention, a 5 dB penalty should be applied to the above criteria.

As with most Local Authority policies on noise and planning the City of Westminster observe the advice contained in Planning Policy Guidance Note 24 (PPG24). This recommends that where a potential 'new' noise source, which is industrial or commercial in nature, is introduced to a mixed commercial and residential area, the likelihood of noise complaints should be assessed using BS 4142: 1997 "Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas". The above City of Westminster noise emission standards are derived from the BS 4142 method.

The general principle of the BS 4142 assessment methodology is that the likelihood of noise complaints can be assessed by comparison with the prevailing background noise conditions at any surrounding noise sensitive premises.

The assessment criteria designates that where the specific noise level of the new plant is 10 dB above the background noise level  $L_{A90}$ , complaints are likely. Where the new noise is 5 dB above the background noise level, it is considered to be of marginal significance. Where the noise level of the plant is 10 dB below the background level  $L_{A90}$ , the standard states that this is a positive indication that complaints regarding the noise are unlikely

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#### 4. BASELINE SURVEY

An acoustic survey was carried out at 118-124 Charing Cross Road roof area to establish the prevailing environmental noise conditions local to the site so as to enable the setting of appropriate noise limits for new plant installations. Both qualitative observations and objective measurement data were recorded.

##### 4.1 General observations and comments

The noise climate in the area where the noise monitor was installed is typically dominated by distant, shielded traffic from Charing Cross Road.

##### 4.2 Survey details

The survey comprised automated unattended measurements at a fixed position between 21:00 on the 30<sup>th</sup> of March and 02:00 on the 6<sup>th</sup> of April 2010. The sound level meter was situated at roof level, as shown in Figure 1. This location was chosen as being representative of the typical background noise climate.

The automatic sound level meter established values for the A-Weighted  $L_{eq}$  and  $L_{90}$  levels measured for sequential 5-minute sample periods. The instrument calibration was checked for sensitivity before and after the measurements and found to be within an acceptable range. Appendix A provides a glossary of these terms. Details of the equipment used are provided in Appendix B.

The periods when meteorological conditions were wet with cloud cover and occasional showers are not suitable for environmental noise measurements. In accordance with guidance given in BS 4142 these periods have been excluded.

##### 4.3 Summary and analysis of results

Table 2 summarises the measurement results into single figure values for day-time, evening-time and night-time periods. These measurements show the evolution of noise levels during a typical day, evening and night-time period. It can be seen that for the  $L_{Aeq}$  noise levels, a decrease of around 1dB is observed between the average day, evening and night-time  $L_{Aeq}$  levels. Typical background noise levels, as measured by the  $L_{A90}$  parameter, are the same for day and evening periods and decrease by approximately 1dB at night-time. The measurement results are shown graphically for the full survey period in Appendix B.

**Table 2. Summary of measurement results**

Period	Ambient noise level $L_{Aeq}$ dB(A) (typical average)	Background Noise Level $L_{A90}$ dB(A) (typical lowest)
Day (0700-1900)	54	48
Evening (1900-2300)	53	48
Night (2300-0700)	52	47

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## 5. NOISE IMPACT DUE TO DEVELOPMENT

Noise emission from the development (i.e. from proposed external mechanical plant) will need to be controlled to achieve acceptable levels of environmental noise both within the development itself and in the surrounding areas.

It is proposed that the new M&E plant should be designed to achieve noise levels totalling no more than 5dB(A) for day-time and 10dB(A) for evening and night time below the existing background noise level  $L_{A90}$  as measured at the nearest residential buildings. This is in accordance with the Westminster City Council noise policy, since the existing external noise level for day-time does not exceed World Health Organisation (WHO) Guideline of  $L_{Aeq,12hrs}$  55 dB, however the external noise level for evening-time and night-time exceed the WHO Guideline of  $L_{Aeq,4hrs}$  50 dB and of  $L_{Aeq,8hrs}$  45 dB, respectively. The proposed criteria for M&E noise limits are shown, below, in Table 3.

It is important to recognise at this early stage that these recommended design criteria apply to the total contribution of noise from all plant associated with the development scheme.

Table 3. Plant noise limits

Period	Plant Noise Rating Limit at the nearest residence facade $L_{Aeq,15min}$ dB
Day (0700-1900)	43
Evening (1900-2300)	38
Night (2300-0700)	37

*If there is determined to be a likelihood of tonal or intermittent content emitting from the equipment, the plant noise limits shall be reduced by 5 dB*



## 6. CONCLUSION

- A background noise survey has been undertaken at 118-124 Charing Cross Road roof area where new M&E plant associated with the creation of a new TK Maxx store will be installed.
- The results of the background noise survey and observations made at the site have been presented in this report.
- Noise level limits for M&E plant associated with the new store have been proposed based upon the measured existing noise levels, the noise policy guidance provided by the Westminster City Council and the guidance for the assessment of complaint likelihood provided in BS 4142. The M&E plant installation should be designed in a way which allows these criteria to be achieved.

## APPENDIX A – GLOSSARY OF TERMS

### Decibel (dB)

The decibel is the unit used to quantify sound pressure levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). Therefore, a logarithmic scale is used to describe sound pressure levels and also sound intensity and power levels. The logarithm's are taken to base 10. Hence an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in Pascals). Subjectively, this increase would correspond to a doubling of the perceived loudness of sound.

### A-Weighting

The 'A' weighting is a correction term applied to the frequency range in order to mimic the sensitivity of the human ear to noise. It is generally used to obtain an overall noise level from octave or third octave band frequencies. An 'A' weighted value would be written as dB(A).

### $L_{Aeq,T}$

The A-Weighted equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T).  $L_{Aeq,T}$  is used to describe many types of noise and can be measured directly with an integrating sound level meter.

### $L_{A90,T}$

The A-Weighted noise level exceeded for 90% of the specified measurement period (T).

### $L_{Amax}$

The highest A-Weighted noise level recorded during a noise event.

### Rating Level

The specific noise level of the noise source plus any adjustment for characteristic features of the noise.

## APPENDIX B – DETAILS OF ENVIRONMENTAL NOISE SURVEY

### Automated Measurements

#### Automated noise logger:

*Svantek - Sound Level Meter: SVAN 949 sn: 6750*

*GRAS - Microphone: 40AE sn: 49513*

*Svantek - Pre-amplifier: SV 12 sn: 5917*

#### Additional Equipment

*Brüel and Kjær - Sound Calibrator: 4231 sn: 2291561*

All this equipment conforms to the requirements for type 1 sound level meters and was calibrated to (traceable) UKAS standard. It was checked for sensitivity both before and after the survey and found to be within the acceptable tolerance.

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Figure B1. Unattended Noise Measurement Survey Data (rain periods were excluded)

