



South West Hertfordshire Secondary
Schools
Site C

Noise Review

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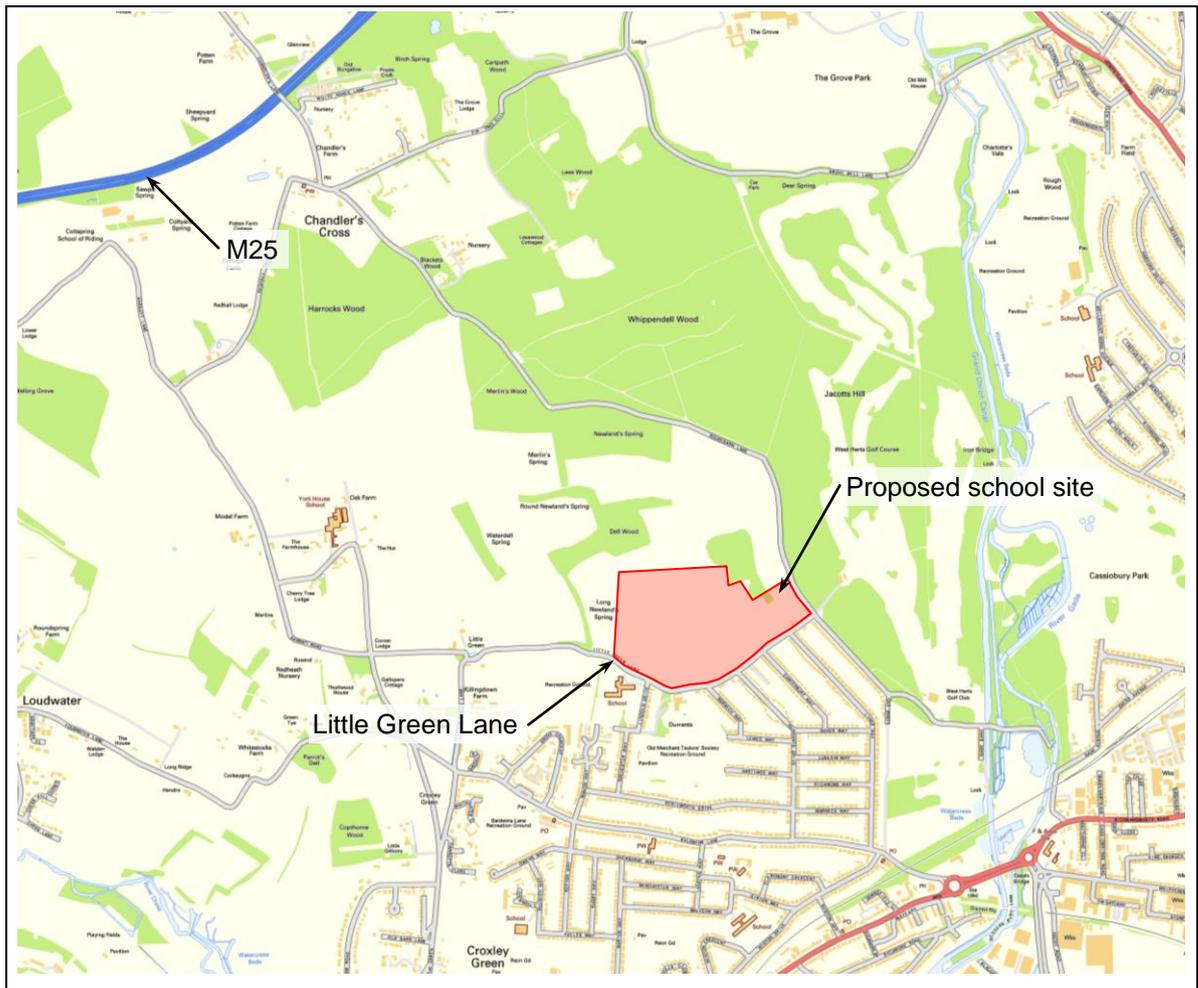
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1 Introduction

General

- 1.1 JMP Consultants Ltd (JMP) has been commissioned by Hertfordshire County Council to undertake a Noise Review and comparison of the noise environment at four potential secondary school sites (Site A, Site B, Site C and Site D), to support the LDF preparation process.
- 1.2 This report focuses on Site C, which is located on land north of Little Green Lane, Croxley Green. The southern boundary of the site is formed by Little Green Lane. The site location is shown in Figure 1.1.

Figure 1.1 Site location



Source: OS OpenData. Contains Ordnance Survey data © Crown copyright and database right 2011

Scope of the Noise Review

- 1.3 In order to establish the noise environment around the school site this Noise Review will present the findings of a period of noise monitoring undertaken within and around the proposed school site.
- 1.4 An Executive Summary document containing an appraisal of the noise environment at all four potential sites has been produce separately.

Report Structure

1.5 Following this introductory section the structure of the this report is as follows:

- **Section 2** defines the noise and planning context of the proposed development and the local area.
- **Section 3** describes the methodology applied to the assessment, specifically the requirements of BB93 *Acoustic Design of Schools a Design Guide*.
- **Section 4** presents the assessment findings and summarises the results.
- **Section 5** presents the construction impacts of the proposed development.
- **Section 6** presents the conclusions of the study.

2 Noise Context

General

- 2.1 This section of the report outlines the noise context of the proposed development, particularly with regard to relevant guidance documents. Sound levels and the health impact of noise are also discussed.

The Health Impact of Noise

- 2.2 Long-term exposure to noise (unwanted sound) has been shown to have a negative impact on human health and general wellbeing. The World Health Organisation (WHO) estimates that one in three Europeans is adversely affected by traffic noise. The detrimental effects of traffic noise include the following (source: WHO, 2008).
- Pain and hearing fatigue;
 - Hearing impairment including tinnitus;
 - Annoyance;
 - Interferences with social behaviour (aggressiveness, protest and helplessness);
 - Interference with speech communication;
 - Sleep disturbance and all its consequences on a long and short term basis;
 - Cardiovascular effects;
 - Hormonal responses (stress hormones) and their possible consequences on human metabolism (nutrition) and immune system; and
 - Poor performance at work and school.
- 2.3 As a consequence of the health implications of exposure to noise, it is often considered necessary to determine the existing transport-related noise level at a location of a proposed school development. This planning requirement is principally addressed by Building Bulletin 93 (BB93) 'Acoustic Design of Schools a Design Guide'. With regard to acceptable internal noise levels, BS8233 '*Sound Insulation and Noise Reduction for Buildings*' and the World Health Organisation have recommended limits for school buildings.

Relevant Guidance

BB 93 Acoustic Design of Schools a Design Guide

- 2.4 BB93 provide s regulatory framework for the acoustic design of schools. At the feasibility stage of the planning and design process BB93 recommends that a noise survey is undertaken to establish the suitability of a site for a school development. This Noise Review presents the findings of a noise survey undertaken to do this. Table 2.1 below shows the recommended external noise levels within a playground and at the boundary of a proposed school building.

Table 2.1 Recommended BB93 noise levels

| Criterion | Ideal | Limit |
|---|--|--------------------------|
| The boundary of external premises used for formal and informal teaching | 60dB(A) $L_{Aeq\ 30min}$ | |
| Noise level in an unoccupied playing fields | 50dB(A) $L_{Aeq\ 30min}$ | 55dB(A) $L_{Aeq\ 30min}$ |
| Area used for outdoor teaching activities | At least one area should be below 50dB(A) $L_{Aeq\ 30min}$ | |

Source: BB93

BS8223:1999 Sound Insulation and Noise Reduction for Buildings

- 2.5 BS8223, Table 5 recommends internal noise levels for new or refurbished buildings. These internal noise limits are primarily intended to apply to new or refurbished buildings and are not for the assessment of changes in the external noise environment. Table 2.2 below shows the internal noise levels recommended in BS8223.

Table 2.2 BS8223:1999 Recommended noise levels

| Criterion | Typical situations | Design range L_{AeqT} dB(A) | |
|--|--------------------|-------------------------------|------------|
| | | Good | Reasonable |
| Reasonable listening conditions | Classroom | 35 | 40 |
| Reasonable conditions for study and work requiring concentration | Library | 40 | 50 |

Source: BS8233

- 2.6 In order to convert a monitored noise level to an internal noise level, in accordance with BS8233, it is assumed that:
- An open window will provide a decibel reduction of 13dB(A).
 - A closed double glazed window (specification 6-12-6) will reduce external noise levels by 34dB(A).
 - A closed secondary glazed window (specification 4-200-4) will reduce external noise levels by 43dB(A).

World Health Organisation Guidelines for Community Noise

- 2.7 Guidelines for Community Noise', published by the World Health Organisation in 1999, state that, in order to prevent speech interference, the internal background noise level within a classroom should not exceed 35dB(A) L_{Aeq} during a teaching session. In outdoor playground areas noise from external sources should not exceed 55dB(A) L_{Aeq} . Table 2.3 shows the noise levels recommended in this document.

Table 2.3 World Health Organisation recommended noise levels

| Specific environment | L_{Aeq} dB(A) | Time base (hours) |
|---------------------------|-----------------|-------------------|
| School classrooms | 35 | During Class |
| School playground outdoor | 55 | During Play |

Source: Guidelines for Community Noise, World Health Organisation (1999)

3 Methodology

Noise Monitoring

- 3.1 To determine the noise levels at the site, it was necessary to conduct a period of on-site noise monitoring. The on-site noise monitoring was conducted by a JMP staff member who has attained the Institute of Acoustics (IOA) *Certificate of Competence in Environmental Noise Measurement*.
- 3.2 At this feasibility stage, noise was monitored for a limited period at the locations indicated in Figure 3.1 below. The monitoring locations were selected due to their proximity to nearby traffic noise sources and the proposed locations of playgrounds and school buildings.
- 3.3 The monitoring was undertaken during typical school hours (including a peak traffic period) on Wednesday 13th July 2011 between 14:56 and 17:59. At each specified point noise was measured for periods of 15 minutes at various times throughout the monitoring period. During the monitoring period weather conditions were dry and warm with low wind speeds.

Figure 3.1 Monitoring Locations



Source: JMP

Noise Meters

- 3.4 Noise was monitored using a Norsonic 140 integrated sound level meter. All measurements were A-weighted and recorded using a fast time response. The noise meter was set at a height of 1.5m above the ground. The meter and microphone were protected from adverse weather conditions by a weather protection kit.
- 3.5 The Norsonic noise meter was calibrated using a Norsonic calibrator at the beginning and end of each monitoring period. No significant deviations were observed. Calibration certificates can be provided upon request.

4 Results

Noise Environment

4.1 Measured external noise levels at the monitoring locations are shown below in Table 4.1.

Table 4.1 Noise levels at the monitoring locations

| Location / distance from dominant noise source(s) | Time | | L _{Aeq T min} dB(A) * | Observed noise sources |
|---|--------------------|-------|-----------------------------------|--|
| | Start | Stop | | |
| 1 10m from Little Green Lane | 15:39 | 15:54 | 46.1 | Intermittent traffic on Little Green Lane. |
| | 17:34 | 17:44 | 50.0 | |
| | - | - | - | |
| | Arithmetic Average | | 48.1 | |
| 2 10m from Little Green Lane | 14:56 | 15:11 | 49.5 | Intermittent traffic on Little Green Lane. |
| | 15:57 | 16:12 | 45.7 | |
| | 17:22 | 17:32 | 47.0 | |
| | Arithmetic Average | | 47.4 | |
| 3 Within the site | 15:18 | 15:33 | 50.1 | No noise source was dominant. |
| | 16:18 | 16:33 | 48.5 | |
| | 17:49 | 17:59 | 46.4 | |
| | Arithmetic Average | | 48.3 | |

* The Ambient Noise Level during the monitoring period was consistent. Therefore the 10 or 15 minute measurements are considered representative of a 30 minute period.

Analysis

Playground Area – The Ideal Noise Limit

4.2 The noise levels measured at all the locations indicated in Figure 3.1 meet the ideal limit of 50dB(A) L_{Aeq30min} recommended by BB93 for an area used for outdoor teaching across the site across the site.

Playground Area – The Upper Noise Limit

4.3 The noise levels measured at all the locations indicated in Figure 3.1 meet the upper noise limit of 55dB(A) L_{Aeq30min} as recommended by BB93 for an area used for outdoor teaching across the site across the site.

School Building Areas

4.4 The noise levels measured across the site meet the required upper permitted noise level presented in BB93 at the boundary of a proposed school building.

5 Construction Impacts

General

- 5.1 In terms of construction, the main noise impacts that are required to be considered are the generation of noise arising from construction plant. For this site, the sensitive receptors are located on Little Green Lane.

Recommended Measures

- 5.2 To minimise the impact of construction noise it is recommended that the following measures are implemented:
- Noise-generating plant should be placed as far as possible from sensitive receptors.
 - Where possible, fixed plant/facilities should be powered by shore-supply rather than by generators.
 - Construction plant and equipment should be:
 - Maintained to ensure optimum performance.
 - Fitted with appropriate silencers, mufflers or acoustic screens.
 - Operated in a manner that will reduce noise emissions.
 - Vehicles and plant should be switched off, or throttled down to a minimum, when not in use.
 - Nearby residents should be shielded from noise by temporary noise hoardings located along the perimeter of the work site.
 - Where practical, mulching-breaking equipment should be used in preference to percussion-breaking machines.
 - The (general) permitted hours of site operation are limited to:
 - Monday to Friday 0:800 hrs to 18:00 hrs.
 - Saturday 08:00hrs to 13:00 hrs.
 - No working on Sunday or Bank Holidays.

6 Conclusion

- 6.1 The measured noise levels taken at the site meet the ideal noise limit levels as prescribed by BB93 for an area to be used for outdoor teaching.
- 6.2 The measured noise levels taken at the site meet the upper noise limit as prescribed by BB93 for an area used for outdoor teaching at all locations.
- 6.3 The noise levels measured across the site meet the required upper permitted noise level presented in BB93 at the boundary of a proposed school building.