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STREET CRANE COMPANY
TOWN END WORKS, CHAPEL-EN-LE-FRITH

NOISE IMPACT ASSESSMENT

Report **7315-NIA-01**

Prepared on 1 August 2012

Issued For:

Street Crane Company

Town End Works

Chapel-en-le-Frith

High Peak

Derbyshire

SK23 0PH

ISO 17025
ISO 9001
committed to CSCS Platinum award

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1.0 INTRODUCTION

Clement Acoustics Ltd has been commissioned by Street Crane Company, Town End Works, Chapel-en-le-Frith, High Peak, Derbyshire, SK23 0PH to measure existing background noise levels at the above site. Measured noise levels will be used to determine noise emission criteria for the proposed construction works in agreement with the planning requirements of the Local Authority.

This report presents the results of the environmental survey followed by noise impact calculations and outlines any necessary mitigation measures.

2.0 ENVIRONMENTAL NOISE SURVEY

2.1 Procedure

Measurements were undertaken at the position shown in Site Plan 7315-SP1. The choice of this position was based both on accessibility and on collecting representative noise data in relation to the nearest noise sensitive receivers.

Continuous automated monitoring was undertaken for the duration of the survey between 14:30 on 27 June and 14:00 on 28 June 2012.

Background noise levels at the monitoring position were dominated by road traffic noise from Sheffield Road and existing commercial operations. This included the existing Street Crane facilities opposite and the council depot yard within the immediate vicinity.

Weather conditions were generally dry with light winds, therefore suitable for the measurement of environmental noise.

The measurement procedure generally complied with BS7445:1991. *Description and measurement of environmental noise, Part 2- Acquisition of data pertinent to land use*.

2.2 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed.

The equipment used was as follows.

- Svantek Type 957 Class 1 Sound Level Meter
- Norsonic Type 1251 Class 1 Calibrator

3.0 RESULTS

The $L_{Aeq:\ 5min}$, $L_{Amax:\ 5min}$, $L_{A10:\ 5min}$ and $L_{A90:\ 5min}$ acoustic parameters were measured at the location shown in Site Plan 7315-SP1. The measured levels are shown as a time history in Figure 7315-TH1.

Minimum background levels are shown in Table 3.1.

	Average ambient noise level $L_{Aeq:\ 5min}$ dB(A)	Minimum background noise level $L_{A90:\ 5min}$ dB(A)
Daytime (07:00 - 23:00)	62	45
Night-time (23:00 - 07:00)	56	47

Table 3.1: Minimum background noise levels

4.0 NOISE CRITERIA

In order to ensure the amenity of nearby noise sensitive recivers is protected it is prudent to ensure noise emissions of proposed construction works are commensurate with current British Standard BS4142.

BS4142:1997:'*Method for rating industrial noise affecting mixed residential and industrial areas*' states that a noise rating 5dB above the background noise level is of 'marginal significance'. If the difference is of 10dB or more, then there is an indication that 'complaints are likely'. A noise rating level of 10dB below the existing background noise is defined as 'a positive indication that complaints are unlikely'.

Since the construction works will be undertaken during daytime hours and is considered a temporary noise source, we propose to base this assessment on the daytime average measured ambient noise level of 62dB(A).

Proposed permanent plant installations will be based on the daytime minimum measured background level of L_{A90} 45dB to ensure the assessment is as robust as possible.

5.0 DISCUSSION

5.1 Construction Noise Assessment

It is understood that the proposed construction works will take place to the east of the existing site, where a new warehouse facility will be built. The nearest noise sensitive receiver to the proposed construction works is the rear facade of the houses on Buxton Road, approximately 120m away.

The expected construction works will comprise operations including lorries, bulldozers, JCB's and cranes.

Based on British Standard 5228:1997 *'Noise and vibration control on construction and open sites'*, the expected noise emissions will be as follows:

Source	*Sound Pressure Level (dB) at 10m*
Dozer (clearing site)	88
Wheeled excavator/loader (JCB)	83
Lorry (clearing site)	82

Table 5.1 Provided Sound Pressure Levels

Taking all necessary acoustic corrections into consideration, including distance corrections, noise levels expected at the closest residential receiver would be as shown in Table 5.2. Here the predicted reciever level is compared to the existing average daytime ambient noise profile of the area. Detailed calculations are shown in Appendix B1.

Calculated Noise Rating Level at Receiver $L_{Aeq,5mins}$	Measured Average Ambient Noise $L_{Aeq,5mins}$
63 dB(A)	62 dB(A)

Table 5.2: Noise emissions level for construction noise against average ambient

As shown in Appendix B1 and Table 5.2, transmission of noise to the nearest sensitive window due to the effects of the proposed extract system would be comparable with the existing ambient noise profile of the area. Since there are already commercial processes being undertaken nearby, the proposed construction works would be deemed in-line with existing sources and would therefore

not be expected to cause complaints. It should be noted that this assessment has assumed concurrent operation of all machinery within the same hour period.

We would recommend that it is ensured no construction works during night-time hours, as this would result in noise emissions occurring outside of a time when noise from nearby commercial activity is already present.

5.2 Plant Noise Assessment

Upon completion of the new warehouse, it is understood that a generator unit will be installed within an enclosure to service the facility.

The expected noise emissions level from the generator unit is 75dB(A) at 1m. The nearest noise sensitive receiver to the proposed generator is likely to be the rear facade of the houses on Buxton Road, approximately 120m away.

Taking all necessary acoustic corrections into consideration, including distance corrections, noise levels expected at the closest residential receiver would be as shown in Table 5.3. Detailed calculations are shown in Appendix B2.

Calculated Noise Rating Level at Receiver $L_{Aeq,5mins}$	Measured Minimum Background Noise $L_{A90,15mins}$	Difference	Indication
33 dB(A)	45 dB(A)	-12 dB	Positive indication complaints are unlikely

Table 5.3: Noise emissions level and assessment for plant installation

As shown in Appendix B2 and Table 5.3, transmission of noise to the nearest sensitive window due to the effects of the proposed generator would be would indicate that there is a 'positive indication that complaints are unlikely' as per guidance in BS4142:1997. Noise emission levels would therefore not be expected to have a negative impact on the amenity and living conditions of nearby residential receivers, without the need for any particular mitigation measures.

6.0 CONCLUSION

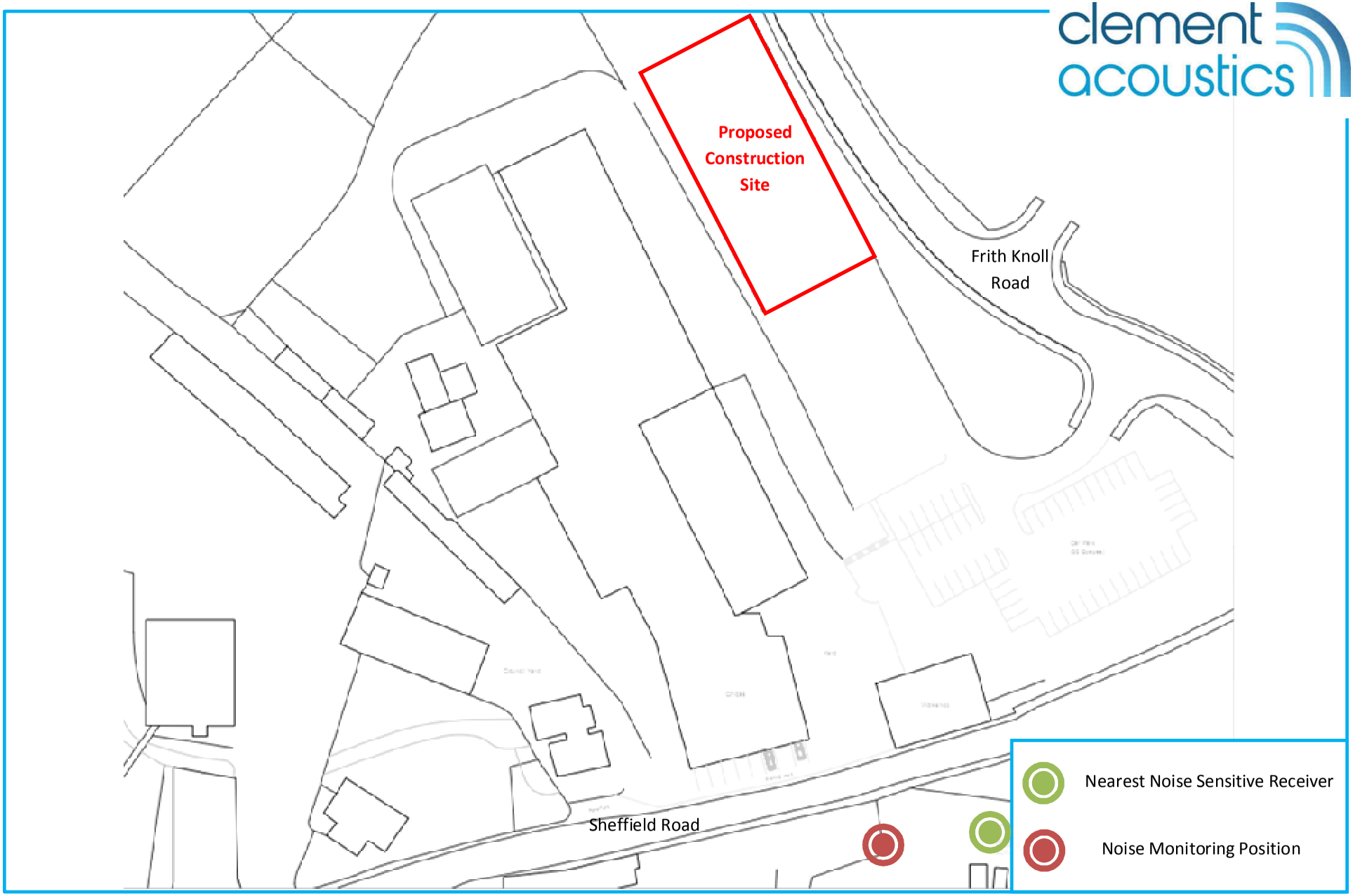
An environmental noise survey has been undertaken at Street Crane Company, Town End Works, Chapel-en-le-Frith, High Peak, Derbyshire, SK23 0PH. The results of the survey have enabled

predicted noise emissions levels from proposed construction activity and permanent plant to be compared with existing ambient and background noise levels, respectively.

Calculations show that noise emissions from the proposed construction activities would be in line with the existing ambient noise profile of the area at nearby noise sensitive receivers and would therefore be unlike to cause complaints.

Additional calculations show that noise emissions of the proposed permanent plant installation would be between unlikely to cause complaints as per guidance in BS4142:1997, without the need for any particular mitigation measures.

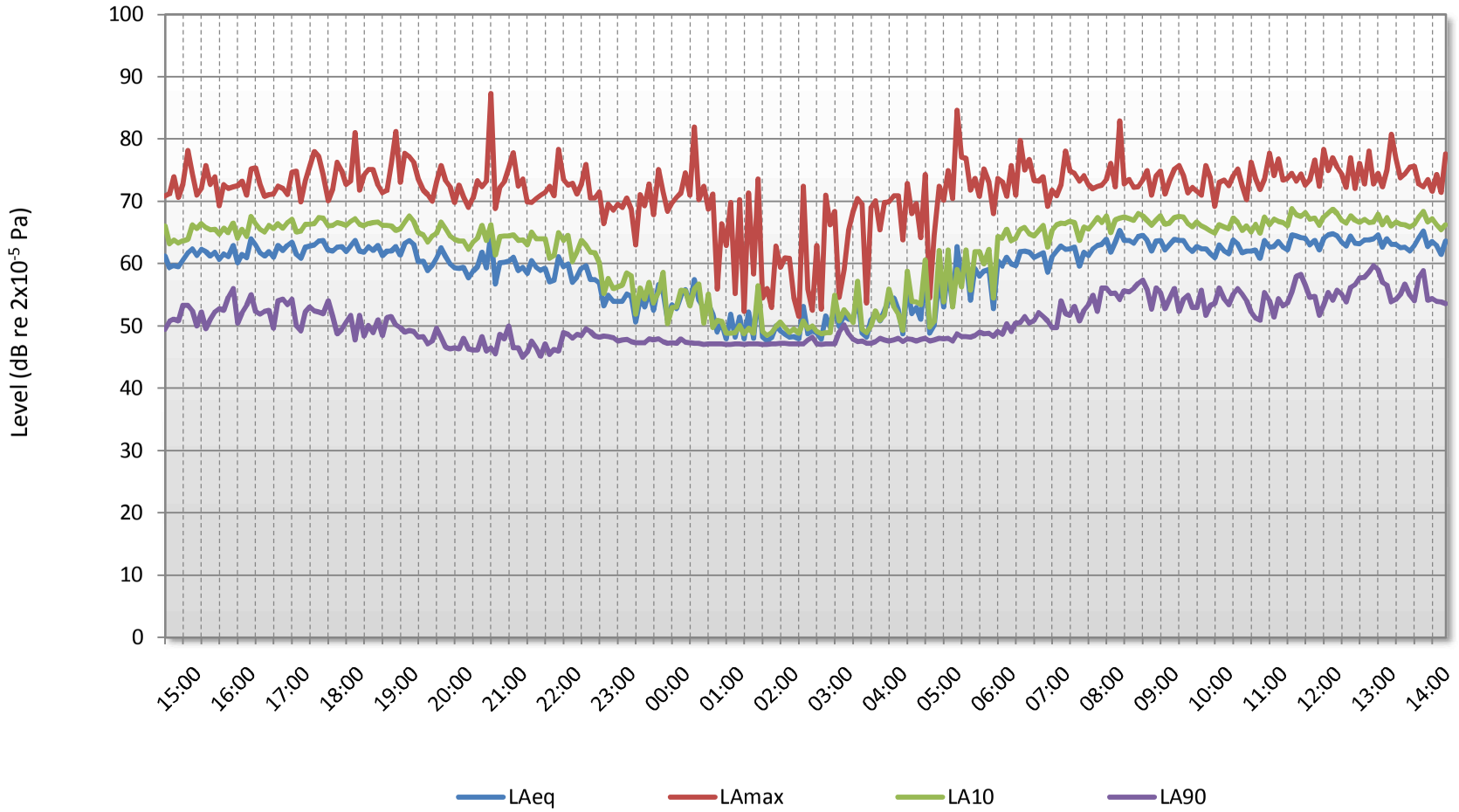
Report by	Checked by
Max Foster TechIOA	**Florian Clement MIOA**



7315-SP1 Indicative site plan showing noise monitoring position and nearest noise sensitive receiver **Date:** 08 August 2012

STREET CRANE, SHEFFIELD ROAD, CHAPEL-EN-LE-FRITH

Environmental Noise Time History
27 June 2012 to 28 June 2012



7315-TH1

APPENDIX A

GLOSSARY OF ACOUSTIC TERMINOLOGY

dB(A)

The human ear is less sensitive to low (below 125Hz) and high (above 16kHz) frequency sounds. A sound level meter duplicates the ear's variable sensitivity to sound of different frequencies. This is achieved by building a filter into the instrument with a similar frequency response to that of the ear. This is called an A-weighting filter. Measurements of sound made with this filter are called A-weighted sound level measurements and the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq}. The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for not more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise

L_{90}

This is the level exceeded for not more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 10 such octave bands whose centre frequencies are defined in accordance with international standards.

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than one alone and 10 sources produce a 10dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Sound intensity is not perceived directly at the ear; rather it is transferred by the complex hearing mechanism to the brain where acoustic sensations can be interpreted as loudness. This makes hearing perception highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a reasonable guide to help explain increases or decreases in sound levels for many acoustic scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud
20	About 4 times as loud

Barriers

Outdoor barriers can be used to reduce environmental noises, such as traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and its construction.

Reverberation control

When sound falls on the surfaces of a room, part of its energy is absorbed and part is reflected back into the room. The amount of reflected sound defines the reverberation of a room, a characteristic that is critical for spaces of different uses as it can affect the quality of audio signals such as speech or music. Excess reverberation in a room can be controlled by the effective use of sound-absorbing treatment on the surfaces, such as fibrous ceiling boards, curtains and carpets.

APPENDIX B

7315

STREET CRANE COMPANY, TOWN END WORKS, CHAPEL-EN-LE-FRITH

APPENDIX B1: EXTERNAL CONSTRUCTION NOISE EMISSIONS CALCULATION

Receiver: Outside Receiver Window
Source: Proposed Construction Works

	dB(A)
Provided Continuous Sound Pressure Level at 10m	
Dozer (clearing site)	88
Correction for 15 minutes usage in each hour	-6
Distance correction to Receiver, dB (120m)	-22
Sound Pressure Level at Receiver due to Dozer	**60**
Provided Continuous Sound Pressure Level at 10m	
Wheeled excavator/loader (JCB)	83
Correction for 30 minutes usage in each hour	-3
Distance correction to Receiver, dB (120m)	-22
Sound Pressure Level at Receiver due to JCB	**58**
Provided Continuous Sound Pressure Level at 10m	
Lorry (clearing site)	82
Correction for 15 minutes usage in each hour	-6
Distance correction to Receiver, dB (120m)	-22
Sound Pressure Level at Receiver due to Lorry	**54**
Sound Pressure Level at Receiver due to all construction works	**63**

Average Daytime LAeq	**62**

APPENDIX B2: EXTERNAL PLANT NOISE EMISSIONS CALCULATION

Receiver: Outside Receiver Window
Source: Proposed Generator Plant

	dB(A)
Provided Sound Pressure Level at 1m	
External generator plant	75
Distance correction to Receiver, dB (120m)	-42
Sound Pressure Level at Receiver due to Proposed Generator	**33**

Minimum Measured LA90	**45**