Plant Noise Impact Assessment

Client:	Cube Management LLP
Project:	Proposed Tesco Express Wilthorpe Hotel 128-162 Huddersfield Road Barnsley S75 1HA
Our Reference:	RF 84074
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Executive Summary

Noise Solutions Ltd has been commissioned by Cube Management LLP to undertake a plant noise impact assessment for a proposed Tesco Express store, 128-162 Huddersfield Road, Barnsley.

A noise survey was undertaken to determine the existing background noise level at the noise sensitive receptors nearest to the site during the evening and night-time periods. Cumulative noise levels for the proposed plant have been predicted at the nearest noise sensitive receptors to the site and assessed using typical local authority emissions criteria.

The noise level predictions demonstrate that cumulative plant noise emissions are anticipated to be;

- At least 12dB below the lowest measured background noise level during the night-time period.

- At least 1dB below the lowest measured background noise level during the daytime period.

Barnsley Metropolitan Borough Council noise emissions criteria had not been confirmed at the time of assessment. However, local authorities typically impose a plant noise emissions criterion of 5dB or 10dB below the lowest measured background noise level (L_{A90}).

Mitigation measures, such as acoustic wall lining or screening, may be required if the local authority impose stringent noise emissions criteria.

The proposed plant is not anticipated to have an adverse effect on nearby residential properties. Therefore, noise should not be grounds for refusal of planning permission.

1.0 Introduction

Noise Solutions Ltd has been commissioned by Cube Management LLP to undertake a plant noise impact assessment for a proposed Tesco Express store, 128-162 Huddersfield Road, Barnsley.

A noise survey was undertaken to determine the existing background noise level at the noise sensitive receptors nearest to the site during the evening and night-time periods. Cumulative noise levels for the proposed plant have been predicted at the nearest noise sensitive receptors to the site and assessed using typical local authority emissions criteria.

2.0 Site Layout and Nearest Residential Properties

The proposed Tesco Express store is to be located on the site of an existing public house on the southern side of Huddersfield Road. It is understood that the proposed plant is to be installed externally to the side of the store. Proposals include for the installation of one new Searle Dual Condenser unit, two new air conditioning (AC) units serving the sales floor and one new AC unit serving the cash office.

The proposed Dual Condenser unit will operate 24 hours a day. However, the unit will run at a reduced setting during the night-time period (23.00 – 07.00 hours). The AC units will operate only during the daytime period when the proposed store is open. Appendix A contains details of the proposed plant units.

The area surrounding the site is generally residential in nature. The nearest noise sensitive receptor to the plant area is a flat above a shop approximately 17m west (R1) of the proposed plant area.

The topography of the surrounding area is generally on a steep hill such that the existing building is built into a cutting and the open land behind the proposed store is approximately at second floor ground level. In addition the ground level of the residential properties on the other side of Huddersfield road is approximately one storey below that of the proposed store. Appendix B contains a plan showing the site and surrounding area.

3.0 Existing Noise Climate

3.1. Measurement Period

Measurements of the existing background noise level were taken between 22.00 and 23.00 hours on Thursday 23rd February and 01.00 and 02.00 hours on Friday 24th February 2012.

The weather during the survey period was cloudy but dry with light but occasionally gusting winds from the west. There was no precipitation during the course of the survey and all road surfaces in the surrounding area were dry. The temperature was approximately 12°C.

3.2. Measurement Position

The measurement position was located to the west of the store along Greenfoot Lane approximately 40 metres from its junction with Huddersfield Road. This location is considered to be representative of the noise climate at the façades of the nearest residential properties to the proposed plant.

In accordance with BS 7445-2:2003 *'Description and measurement of environmental noise – Part 2 : Guide to the acquisition of data pertinent to land use'*, the measurements were taken at least 3.5m from any reflecting surface other than the ground with the microphone positioned at a height of 1.5m.

3.3. Noise Measurement Equipment

Noise measurements were obtained using a Svantek 949 Class 1 Sound Level Meter (serial no. 12262) with a SV22 condenser microphone (serial no. 4012444) and a SV12L preamplifier (serial no. 13163).

The meter was calibrated before and after the survey using a Svantek SV30A Class 1L Acoustical Calibrator (serial no. 10847) with a level of 114dB at 1000Hz applied to the measurement equipment. The readings were found not to have deviated.

The meter and calibrator used in the survey were verified by Acoustic Calibration Services Ltd with certificates of calibration (nos. 13680 and 136769) issued 7th April 2011 complying with the laboratory test requirements of the United Kingdom Accreditation Service (UKAS).

3.4. Noise Level Measurements

The following broadband noise parameters were measured over 10 minute intervals;

$L_{Aeq,T}$	The "A" weighted equivalent continuous noise level
$L_{A90,T}$	The "A" weighted level exceeded for 90% of sample period
$L_{A10,T}$	The "A" weighted level exceeded for 10% of sample period
L_{Amax}	The "A" weighted maximum noise level

3.5. Results

The results of the noise survey are considered to be representative of typical background noise levels at the façades of the nearest residential receptors to the proposed plant during the quietest times of the day and night-time periods.

The noise climate at the measurement position was dominated by local and distant road traffic.

The lowest background noise level during the evening period was measured to be 40dB $L_{A90(10mins)}$.

The lowest background noise level during the night-time period was measured to be 33dB $L_{A90(10mins)}$.

The full set of measured noise levels can be found in Appendix C.

4.0 Noise Assessment Criteria

Barnsley Metropolitan Borough Council noise emissions criteria had not been confirmed at the time of assessment. However, local authorities typically impose a plant noise emissions criterion of 5dB or 10dB below the lowest measured background noise level (L_{A90}).

5.0 Noise Impact Assessment

Plant noise levels have been predicted at the facades of the nearest residential receptors. Predictions have been based upon the manufacturer's noise data given in Appendix A.

Noise levels have been predicted taking into account directivity of sound propagation and the distance between the source and receiver. It should be noted that all noise predictions have been based upon there being line of sight between the proposed plant and the nearest receptors. The wall/fence surrounding the plant area may provide an element of screening between the plant and the nearest residential properties. However, as access was not available to the proposed plant area, the effect of any screening has not been included in the predictions to ensure a robust assessment.

Noise level predictions during the daytime period have been based upon the Dual Condenser and all three AC units operating simultaneously at full capacity. Night-time noise level predictions have been based upon the Dual Condenser operating at a reduced setting with the AC units switched off. A +3dB correction has been applied to all noise predictions to account for the fact that the proposed plant is to be located within close proximity of the facades of the store building.

Table 1, below, summarises the results of the predicted noise calculations. The full set of calculations can be found in Appendix D.

Table 1 Summary of predicted noise levels

Period	Receptor	Predicted noise level at receptor (dBA)	Lowest measured L_{90} (dBA)	Difference (dB)
Daytime (07.00 – 23.00 hours)	R1	39	40	-1
Night-time (23.00 – 07.00 hours)	R1	21	33	-12

The noise level predictions demonstrate that cumulative plant noise emissions during the night-time period will be at least 12dB below the lowest measured background noise level. This demonstrates compliance with the most stringent plant noise emissions criterion imposed by most local authorities. Therefore,

mitigation measures will not be required to reduce plant noise emissions during the night-time period.

The noise level predictions demonstrate that cumulative plant noise emissions during the daytime period will be approximately 1dB below the lowest measured background noise level. There is likely to be an element of screening provided by the building structure and topology, however, resulting in plant noise levels further below background.

Mitigation measures, such as absorbent wall linings or screening, may be required if the local authority impose stringent emissions criteria.

6.0 Conclusion

Noise Solutions Ltd has been commissioned by Cube Management LLP to undertake a plant noise impact assessment for a proposed Tesco Express store, 128-162 Huddersfield Road, Barnsley.

A noise survey was undertaken to determine the existing background noise level at the noise sensitive receptors nearest to the site during the evening and night-time periods. Cumulative noise levels for the proposed plant have been predicted at the nearest noise sensitive receptors to the site and assessed using typical local authority emissions criteria.

The noise level predictions demonstrate that cumulative plant noise emissions are anticipated to be;

- At least 12dB below the lowest measured background noise level during the night-time period.

- Approximately 1dB below the lowest measured background noise level during the daytime period.

Barnsley Metropolitan Borough Council noise emissions criteria had not been confirmed at the time of assessment. However, local authorities typically impose a plant noise emissions criterion of 5dB or 10dB below the lowest measured background noise level (L_{A90}).

Mitigation measures, such as acoustic wall lining or screening, may be required if the local authority impose stringent emissions criteria.

The proposed plant is not anticipated to have an adverse effect on nearby residential properties. Therefore, noise should not be grounds for refusal of planning permission.

APPENDIX A
Details of proposed plant (sound power levels)

Description	Manufacturer	Unit	L_{eq} (dB)								L_{Aeq} (dB)
			63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
Dual Fan Condenser (night-time set back)	Searle MGB 124	MGB 124	60	57	52	50	44	36	31	31	51
Dual Fan Condenser (full capacity)			74	66	61	60	56	47	43	43	61
Sales Floor AC (daytime only)	Mitsubishi	FDCA 501 HESR	79	75	64	57	59	57	52	52	65
Cash Office AC (daytime only)	Mitsubishi	SRC 28 CD-5	75	70	60	52	52	50	47	47	60

APPENDIX B
Site Plan



APPENDIX C
Measured noise data (dBA)

Time		L_{Max}	L_{eq}	L_{10}	L_{90}
Wed 27th February 2012	22:00 – 22:10	76.8	61.2	64.4	51.5
	22:10 – 22:20	69.1	58.6	62.7	46.3
	22:20 – 22:30	67.9	57.0	61.6	43.8
	22:30 – 22:40	66.8	53.2	57.9	40.5
	22:40 – 22:50	69.7	57.0	61.6	42.2
	22:50 – 23:00	69.3	53.7	58.6	39.5

Time		L_{Max}	L_{eq}	L_{10}	L_{90}
Thurs 28th February 2012	02:00 – 02:10	69.0	46.3	40.6	34.3
	02:10 – 02:20	72.0	51.7	52.9	34.3
	02:20 – 02:30	73.9	53.8	54.9	34.5
	02:30 – 02:40	67.8	48.3	51.0	34.1
	02:40 – 02:50	51.6	36.5	37.6	34.3
	02:50 – 03:00	72.7	51.9	53.6	33.2

APPENDIX D
Predicted noise levels

Receptor R1

Plant	Sound power level (dBA)	Façade correction (dB)	Distance correction (dB)	Resultant @ receptor (dBA)
Dual Fan Condenser (night-time set back)	51	3	-33 (17m)	21
Dual Fan Condenser (full capacity)	61	3	-33 (17m)	31
2 x Sales Floor AC (daytime only)	68	3	-33 (17m)	38
Cash Office AC (daytime only)	60	3	-33 (17m)	30

Cumulative night-time (dBA): **21**

Cumulative daytime (dBA): **39**