Environmental Noise Survey and Plant Noise Impact Assessment

Client:	Aldi Stores Limited
Project:	Aldi Nottingham Road Stapleford
Our Reference:	BS 33713/NIA
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1.0 Introduction

Noise Solutions Ltd has been commissioned by Aldi Stores Limited to undertake a noise survey at the site of the proposed Aldi store, Nottingham Road, Stapleford. The survey was required to determine the existing background noise level at the noise sensitive receptors nearest to the site.

Cumulative noise levels for proposed external plant have been predicted at the most affected noise sensitive receptor and assessed using typically accepted local authority noise emissions criteria.

2.0 Site Layout and Development Proposals

The Aldi store is to occupy a proposed new building on a triangular site bounded by Nottingham Road to the south, Lower Orchard Street to the west and Pinfold Street to the north.

The site is currently occupied by commercial office buildings.

Current plant proposals include for one refrigeration 'free heat pack' and two LT freezer condenser units. It is understood that all equipment runs throughout the daytime and night-time periods.

Plant is to be located externally at the rear (north west corner) of the store building. The most affected noise sensitive property will be proposed new-build houses (R1) to the north west of the store building, on the boundary with Pinfold Street. These houses are approximately 16m from the proposed plant location and will largely have full line of sight to the equipment location.

Plant data has been provided in Appendix A.

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 Wednesday 13th August and Thursday 14th August 2014.

Weather conditions were ideal for the measurement of noise during the survey period, dry with a gentle breeze (<5m/s).

3.2. Measurement Position

The measurement position was located at ground level adjacent to the site on Upper Orchard Street. This location is considered to be representative of the noise climate at the facades of the nearest residences to the site.

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 approximately 1.5m.

3.3. Noise Measurement Equipment

Details of the equipment used during the course of the noise survey have been provided in Table 1, below. The sound level meter was calibrated before and after the survey; no significant change (+/-0.1 dB) in the calibration level was noted.

Table 1 Details of noise measurement equipment

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Rion NL-31 / 00593605	27/01/2014	14412
Condenser microphone	Rion UC-53A / 316131		
Preamplifier	Rion NH-21 / 30365		
Calibrator	Rion NC-74 /35094453	27/01/2014	14411

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 the sample period
$L_{A10,T}$ The "A" weighted level exceeded for 10% of the 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 noise sensitive receptors to the proposed plant.

The results of the survey are shown in Appendix C.

The noise climate at the measurement position was dominated by local and distant road traffic, along with a contribution from trains. Aircraft flyovers were also audible.

Table 2 Summary of noise survey results

Measurement Period	Range of noise levels over measurement period, dB			
	$L_{Aeq(10mins)}$	$L_{Amax(10mins)}$	$L_{A10(10mins)}$	$L_{A90(10mins)}$
Evening (22.00 - 23.00 hours)	46 - 50	51 - 69	47 - 51	44 - 45
Night-time (02.00 - 03.00 hours)	46 - 47	50 - 57	47 - 48	43 - 44

The lowest background noise level during the daytime period was measured to be 44dB $L_{A90(10mins)}$.

The lowest background noise level during the night-time period was measured to be 43dB $L_{A90(10mins)}$.

4.0 Local Authority Requirements

Although local authority noise emissions criteria have not been confirmed, plant noise no louder than a level 5dB below the minimum background noise level assessed at the nearest or most affected noise sensitive residential property is typically considered to be acceptable.

Based on the above criteria the cumulative noise level for the proposed plant at the nearest residential windows must not exceed the limits shown in the table below.

Table 3 Plant noise emission limits at residences

Time	**Plant noise level, dB(A)**
Daytime (07.00 - 23.00)	39
Night-time (23.00 - 07.00)	38

5.0 Noise Impact Assessment

Cumulative plant noise levels have been predicted at the most affected residential receptor (R1) based on the noise data given in Appendix A. Noise levels have been predicted taking into account directivity of sound propagation and the distance between source and receiver.

Noise level predictions during both daytime and night-time periods have been based on all plant operating simultaneously at full capacity.

It should be noted that the proposed plant is not anticipated to exhibit any tonal or impulsive characteristics providing it is well maintained. As a result, the +5dB feature correction detailed in BS4142: 1997*–"Method of rating industrial noise affecting mixed residential and industrial areas"* has not been applied to the noise level predictions.

Table 4, below, summarises the assessment of predicted plant noise levels. The full set of calculations can be found in Appendix D.

Table 4 Assessment of predicted noise levels

Time	**Receptor**	**Predicted noise level at receptor, dB(A)**	**Criterion, dB(A)**	**Difference, dB**
Daytime (07.00 – 23.00)	R1	38	39	-1
Night-time (23.00 – 07.00)		38	38	0

The above noise level predictions are inclusive of an acoustic fence of around 2m height between the plant enclosure and the new-build residences. This

fence could form the northern boundary of the enclosure and should be solid and imperforate with a nominal density of not less than 15kg/m^2.

The predictions demonstrate that cumulative noise emissions from the proposed external plant will comply with typically accepted noise emissions criteria at the most affected noise sensitive receptors during both daytime and night-time periods.

6.0 Summary

Noise Solutions Ltd has been commissioned by Aldi Stores Limited to undertake a noise survey at the site of the proposed Aldi, Nottingham Road, Stapleford. The survey was required to determine the existing background noise levels at the noise sensitive receptors nearest to the site.

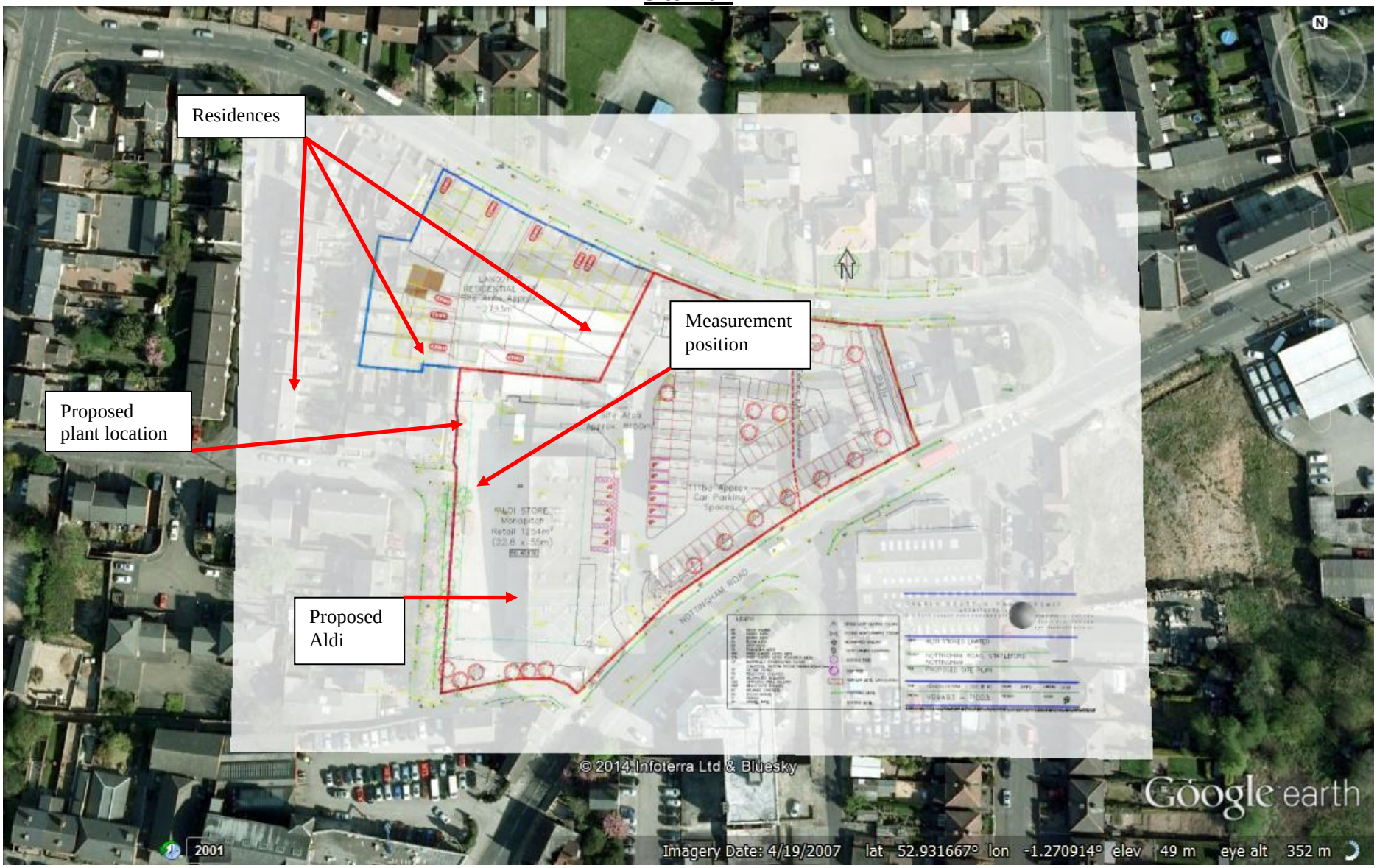
Cumulative noise levels for the proposed plant have been predicted at the most affected noise sensitive receptor locations and assessed using typically accepted noise emissions criteria.

Predictions demonstrate that noise emissions from the proposed plant will comply with typical local authority requirements during both the daytime and night-time periods, inclusive of a solid fence on the northern boundary of the plant enclosure.

APPENDIX A
Plant noise data

Plant	dB(A), at 10m
Arctic Circle Free Heat Pack	41
Arctic Circle LT Unit 1	45
Arctic Circle LT Unit 2	45

APPENDIX B
Site Plan



APPENDIX C
Noise Measurements

Date	Time	L_{Amax} (dB)	L_{Aeq} (dB)	L_{A10} (dB)	L_{A90} (dB)
Wednesday 13th August 2014	22:00 – 22:10	54.1	46.4	48.0	44.4
	22:10 – 22:20	53.1	45.8	47.1	44.3
	22:20 – 22:30	57.3	45.6	46.9	43.9
	22:30 – 22:40	50.5	45.5	46.8	43.9
	22:40 – 22:50	69.4	49.5	50.5	45.4
	22:50 - 23:00	64.4	48.7	47.4	43.8
Thursday 14th August 2014	02:00 – 02:10	57.0	46.6	48.0	43.6
	02:10 – 02:20	56.7	45.5	47.4	43.1
	02:20 – 02:30	50.7	45.7	47.5	43.5
	02:30 – 02:40	50.9	46.3	47.9	44.2
	02:40 – 02:50	50.0	45.9	47.5	43.8
	02:50 – 03:00	53.0	46.0	47.8	43.6

APPENDIX D
Calculations

R1 –New-build houses to north west

Plant		Operates	Lp	at, m	Dist to res., m	Dist correction, dB	Reflections, dB	Screening, dB	Lp at res, dB(A)
Condenser	Arctic Circle	24hr	41	10	20	-6.0	0	0	35.0
LT Unit 1	-	24hr	45	10	19	-5.6	0	-8	31.4
LT Unit 2	-	24hr	45	10	18	-5.1	0	-8	31.9
							Total day		38
							Total night		38

Predictions inclusive of 2m acoustic fence to north boundary of plant enclosure at a nominal distance of 2-3m from the LT units.