



**Environmental Noise Survey and  
Plant Noise Impact Assessment**

Client: Base Build  
Project: 37/39 Broad Street,  
Teddington  
TW11 8QZ  
Our Reference: RF 84608/NIA revA  
Date of Report: 2 September 2013  
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## 1.0 Introduction

Noise Solutions Ltd has been commissioned by Base Build to undertake a noise survey at the site of the proposed M Local store, Broad Street, Teddington prior to the installation of refrigeration and air conditioning equipment.

An assessment was also undertaken of proposed plant noise to determine its impact on nearby residences in accordance with typical local authority requirements.

## 2.0 Site layout and plant proposals

The proposed M Local store is to occupy the ground floor of an existing two-storey building on the corner of Broad Street and Elfin Grove. It is understood that the proposed plant is to be installed externally toward the rear of the site.

Current proposals include the installation of one new refrigeration condenser along with five new air conditioning (AC) units.

The proposed refrigeration plant will operate 24 hours a day. With the exception of the cash office AC which will run 24 hours a day, the AC units and ventilation plant will operate only during the daytime period when the proposed store is open.

Appendix A contains an aerial photograph showing the site and surrounding area.

## 3.0 Nearest noise sensitive receptors

The area surrounding the site is mixed commercial and residential in nature. The most affected residential properties to the proposed plant location are flats above the neighbouring shops along Broad Street (R1) at a distance of around 13-15m from the various plant items. These residences will be likely to have full line of sight to the equipment. In addition there are residential properties (R2) along Elfin Grove, to the rear of the store, at a distance of around 5-10m from the plant although some screening is likely to be provided by the service yard wall.

## 4.0 Existing noise climate

An environmental noise survey was undertaken to establish prevailing noise levels at a location representative of the façades of the nearest noise sensitive receptors to the proposed plant area during the quietest times at which the plant will operate. The results of the noise survey have been summarised in Table 1, below. The full set of measurement results and details of the survey methodology can be found in Appendix B.

*Table 1 Summary of noise survey results*

Measurement period	Range of noise levels over measurement period (dB)			
	L <sub>Amax</sub> (10mins)	L <sub>Aeq</sub> (10mins)	L <sub>A10</sub> (10mins)	L <sub>A90</sub> (10mins)
Evening (22.00 – 23.00 hours)	52 - 82	42 - 68	44 - 73	37 - 48
Night-time (01.00 – 02.00 hours)	53 - 72	40 - 45	41 - 47	36 - 37

## 5.0 Local Authority requirements

The London Borough of Richmond upon Thames typically requires that BS4142:1997-‘Method for rating industrial noise affecting mixed residential and industrial areas’ methodology be used. Therefore, if there is no discreet/tonal component to the plant noise the noise rating level is to be assessed to a level 5dB below the prevailing background ( $L_{A90}$ ) noise level. If however there is a discreet or tonal component to the plant noise then the rating noise level must be controlled to a level 10dB below the existing background noise level.

The proposed equipment is not thought to be tonal in nature and will gradually change duty to respond to demand.

The corresponding noise emission limits are shown in the following table:

Table 2 Plant noise emission limits

Time	$L_p$ , dB(A)
Daytime (07.00 – 23.00)	32
Night-time (23.00 – 07.00)	31

## 6.0 Noise impact assessment

Plant noise levels have been predicted at the facades of the nearest residential receptor. Predictions have been based upon the manufacturer’s noise data provided in Appendix A.

Noise levels have been predicted taking into account directivity of sound propagation and the distance between the source and receiver. Predictions have been based upon there being line of sight between the plant and receivers, inclusive of acoustic wall lining behind the equipment where it is close to the rear wall of the service yard.

It is understood that the refrigeration plant will run for 24 hours a day. The noise level predictions during the daytime and night-time periods have been based upon the cash office AC running at required daytime capacity.

Table 3 summarises the results of the predicted noise calculations. The full set of calculations can be found in Appendix D.

Table 3 Summary of predicted noise levels

Receptor	Period	Plant noise level at receptor (dBA)	Plant noise emission limits(dBA)	Difference (dB)
R1	Daytime	36	32	+4
	Night-time	31	31	0

At receptor R1, it can be seen that plant noise levels are predicted to be marginally in excess of the local authority criteria. Compliance is predicted, however, during the more stringent night-time period. Furthermore, it is noted that the minimum ‘daytime’

background noise level was recorded in the late evening period, when plant will be unlikely to operate at full duty.

## **7.0 Mitigation**

With reference to Section 6.0, it can be seen that at receptor R1 plant noise emissions are predicted to be only marginally in excess of the typical local authority criterion. Acoustically absorbent wall lining has been proposed to reduce noise levels from the AC units.

## **8.0 Summary**

Noise Solutions Ltd has been commissioned by Base Build to undertake a noise impact assessment for refrigeration and air conditioning equipment at the proposed M Local store, Broad Street, Teddington.

A baseline noise survey has been undertaken to establish existing prevailing noise levels at a location representative of the nearest noise sensitive receptors to the proposed site.

An assessment of the noise impact of the proposed plant has been undertaken in accordance with the requirements of London Borough of Richmond upon Thames. Unattenuated noise from the proposed units is predicted to be marginally in excess of typical local authority requirements during the daytime period. Compliance with the criterion is predicted during the more stringent night-time period. Mitigation measures, in the form of an acoustic wall lining, have been suggested such that noise levels from the equipment can be minimised.

**APPENDIX A**  
**Plant data**

<b>Unit</b>	<b>Model</b>	<b>Noise level, dB(A)</b>
Refrigeration condenser	Daytime	34 at 10m
	Night-time	29 at 10m
AC condenser 1-4	FDC100VN	49 at 1m (each)
AC condenser 5	SRC50ZJS	53 at 1m

**APPENDIX B**  
**Details of environmental noise survey**

*B.1. Measurement period*

Measurements of the existing background noise level were taken between 22.00 and 23:00 on Wednesday 31<sup>st</sup> July and 1:00 and 02.00 hours on Thursday 1<sup>st</sup> August 2013. The sound level meter was programmed to record the A-weighted  $L_{eq}$ ,  $L_{90}$ ,  $L_{10}$  and  $L_{max}$  noise indices for consecutive ten-minute sample periods for the duration of the noise survey. Single-octave band frequency data was also measured.

Weather conditions were ideal for the survey period, therefore accurate minimum background noise levels could be assessed.

*B.2. Measurement position*

The measurement position was located in the car park at the back of the store (location indicated on the site plan in Appendix A). 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 under free-field conditions with the microphone positioned at a height of approximately 1.5m above ground level.

*B.3. Noise measurement equipment*

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

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 949 / 8195	11/09/2012	14080
Condenser microphone	MCE212/ 22267		
Preamplifier	Svantek SV12L / 7557		
Calibrator	Svantek SV 40A / 10843	11/09/2012	14079

*B.4. Results*

The results of the noise survey are considered to be representative of typical prevailing noise levels at the façades of the nearest noise sensitive receptors to the proposed plant area during the quietest times at which the plant will operate.

The noise climate at the measurement position was dominated by local road traffic and some noise from existing plant from neighbouring businesses. The results of the noise survey have been provided overleaf.

**APPENDIX B (CONTINUED)**

**Environmental noise survey results**

	<b>Time</b>	<b>L<sub>Max</sub></b>	<b>L<sub>eq</sub></b>	<b>L<sub>10</sub></b>	<b>L<sub>90</sub></b>
Wednesday 31 <sup>st</sup> July 2013	22:00 – 22:10	74.1	48.6	49.5	37.6
	22:10 – 22:20	70.5	47.0	49.6	36.9
	22:20 – 22:30	81.5	56.6	49.9	38.5
	22:30 – 22:40	52.2	41.7	44.2	37.5
	22:40 – 22:50	73.8	54.3	57.0	37.4
	22:50 – 23:00	82.3	68.2	73.1	48.2

	<b>Time</b>	<b>L<sub>Max</sub></b>	<b>L<sub>eq</sub></b>	<b>L<sub>10</sub></b>	<b>L<sub>90</sub></b>
Thursday 1 <sup>st</sup> August 2013	01:00 – 01:10	62.6	44.4	47.4	37.2
	01:10 – 01:20	54.0	39.6	40.6	36.5
	01:20 – 01:30	53.1	40.4	42.7	36.4
	01:30 – 01:40	68.5	42.3	43.9	36.6
	01:40 – 01:50	69.3	41.8	42.0	36.4
	01:50 – 02:00	71.5	45.0	45.3	37.1

APPENDIX C

Aerial photograph showing site and surrounding area





**APPENDIX D**  
**Calculations**

R1 – Residences above store

Plant	Model	Operates	Lp, dB(A)	at, m	Dist to res, m.	Dist loss, dB	Reflections, dB	Screening, dB	Lp at res, dB(A)
Condenser	-	day	34	10	11	-0.8	0	0	33.2
Condenser	-	night	29	10	11	-0.8	0	0	28.2
AC 1	FDC10VN	day	49	1	16	-24.1	0	0	24.9
AC 2	FDC10VN	day	49	1	16	-24.1	0	0	24.9
AC 3	FDC10VN	day	49	1	16	-24.1	0	0	24.9
AC 4	FDC10VN	day	49	1	16	-24.1	0	0	24.9
AC 5	SRC50ZJS	24hr	53	1	17	-24.6	0	0	28.4

Total day 36.0

Total night 31.3