SPORTS DOME – WEEDINGTON ROAD, LONDON NW5 4QQ

BS4142 PLANT NOISE ASSESSMENT

27 February 2019

Queens Crescent Community Association

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ARAN ACOUSTICS

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1.0 INTRODUCTION

Aran Acoustics has been appointed to carry out a noise impact assessment for the retention of an inflatable Sports Dome at Weedington Road, London.

A noise assessment has been requested by the Local Planning Authority to ensure that noise levels from plant and equipment associated with the dome do not cause undue disturbance to nearby noise sensitive locations.

The purpose of this assessment is to determine the existing noise levels at the nearest noise sensitive location and establish the maximum permissible noise level from the unit.

Such to establish suitable plant noise levels an assessment has been carried out to BS 4142: 2014 '*Method for rating and assessing industrial and commercial sound*'. This assessment has been benchmarked against a noise survey carried out on 27 February 2019 and previous surveying carried out for the dome in by RBA Acoustics.

This report therefore describes the noise survey and its results. Figure 4.1 contains a graphical representation of the noise measurements taken on site. Section 5.0 provides the maximum permissible noise levels for the proposed plant. Section 6.0 provides an assessment of plant noise levels based on the proposed location.

2.0 SITE DESCRIPTION

The site is located at Weedington Road in the London borough of Camden. The site currently contains an inflatable Sports Dome along with associated plant. Proposals are in place to retain the existing amenity.

The nearest noise sensitive receptor to the location of the Sports Dome are residential flats located to the north of the site on Weedington Road.

A subjective noise assessment on site determined that the predominant noise sources in the area to impact the site and nearby sensitive receptor is background noise levels from road traffic on surrounding roads.

Figure 2.1 below shows a location map and aerial photo of the site and surrounding area.

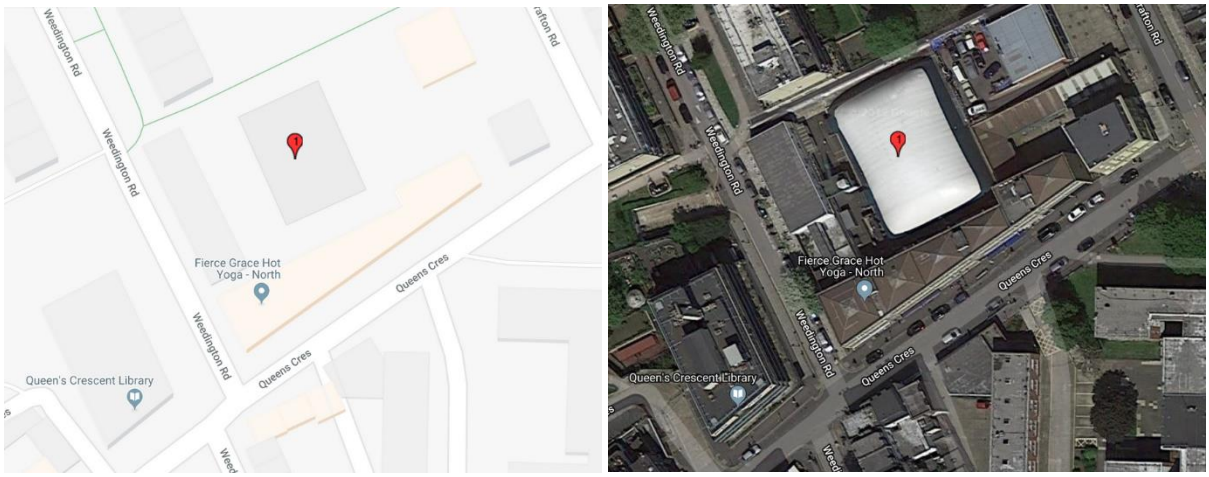


Table 2.1 – Location map and aerial photo of the site

3.0 NOISE SURVEY

An attended noise survey was carried out at the site on Tuesday 26 February 2019. Measurements of background noise levels were carried out at the perimeter of the site adjacent to the residential flats on Weedington Road. Measurements were recorded in 3 no. consecutive 10 minute time periods.

A site plan showing the microphone locations is provided in Appendix A. Site photos are provided in Appendix B.

3.1 Measurement Equipment

The following measurement equipment was used, which complies with the performance specifications for a Class 1 device in accordance with BS EN 61672-1, BS EN 61260 and BS EN 60942.

Name	Serial Number	Last Calibrated	Calibration Due
Norsonic Precision Sound Analyser Type 140	1404768	Oct 2018	Oct 2020
Norsonic Type 1209 Pre-amplifier	31313	Oct 2018	Oct 2020
Norsonic Type 1225 Microphone	157320	Oct 2018	Oct 2020
Rion Type NC-74 Sound Calibrator	10023283	Feb 2018	Feb 2019

Table 3.1 – Measurement equipment used on site

The meter was calibrated before and after testing - no deviations were found.

3.2 Weather Conditions

The weather was fine and dry for the duration of the survey. Wind speed remained below 5 m/s. The temperature was approximately 18^{o}C.

The weather conditions were seen as suitable for environmental noise surveying in accordance with BS 7445-1:2003 '*Description and measurement of environmental noise*'.

4.0 SURVEY RESULTS

The noise levels measured during the survey period are shown in Table 4.1 below. The full set of acoustic data measured on site is available upon request.

4.1 Background Noise Levels

The following table provides a summary of the noise levels measured at the fixed microphone position during the survey period including the equivalent continuous A-weighted sound pressure level; $L_{Aeq,T}$ and background noise level; $L_{A90,T}$.

Start Time	Average Noise Level L_{Aeq}, dB	Background Noise Level L_{A90}, dB
18:00	54.2	46.9
18:10	53.6	46.8
18:20	53.4	47.2

Table 4.1 - Summary of measured noise levels

4.1.1 Previous Noise Survey Results

A 24-hour noise survey was previously carried out at the site by RBA Acoustics in September 2013. Details of the noise survey and results are provided in the RBA Plant Noise Assessment Report (Ref: 5877/PNA) dated September 2013.

Comparison of results during the same measurement periods shows a slight increase in the background noise levels. This is considered attributable to activities within the Sports Dome at the time measurements by Aran Acoustics were carried out.

Results of the RBA Acoustics noise survey showed that the lowest measured background noise level during the proposed hours of operation for the Sports Dome (24-hours) was **39 dB L_{A90}** measured during the night time period. Aran Acoustic have therefore used this minimum value within our assessment as a worst case scenario.

5.0 ASSESSMENT CRITERIA

Section 4.0 above provides a summary of measured noise levels on site. The following section provides a summary of guidance documentation relevant to this development.

5.1 British Standard 4142

BS 4142:2014 describes a method of determining the level of noise of an industrial nature, together with the procedures for assessing whether the noise in question is likely to give rise to complaints from persons living in the vicinity. As such, an assessment to BS 4142 is typically called for within planning conditions.

The likelihood of complaints in response to a specific noise depends on various factors. BS 4142 assesses the likelihood of complaints by considering the margin by which the noise in question exceeds the background noise level. BS 4142 states that:

a) Typically, the greater this difference, the greater the magnitude of the impact.
b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

This standard also allows for an appropriate correction for the acoustic features present in the noise using a number of methods. A correction should be applied if one or more of the following features (see the list below), are present within the noise sources in question.

- The noise is of a tonal nature, i.e. it contains a distinguishable, discreet, continuous note such as whine, hiss, screech, hum;
- The noise is impulsive, i.e. it contains distinct impulses such as bangs, clicks, clatters, or thumps;
- The noise contains other characteristics that are neither tonal nor impulsive but is irregular enough to attract attention.

5.2 Camden Local Plan – Policy A4

The Camden Local Plan sets out the Councils planning policies when deciding planning applications for the Borough. Policy A4 and Appendix 3 set of the criteria for noise producing development. Appendix 3 states the following in relation to plant noise:

***Industrial and Commercial Noise Sources**: A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion).*

5.3 Summary of Guidance Documentation

It can be concluded from BS4142 guidance document and Camden's Local Planning Policy, that noise levels from plant and equipment associated with the development should not generally exceed -10 dB below the background noise level when measured at the nearest noise sensitive location. This is a positive indication of low noise impact.

5.4 Target Plant Noise Levels

It is understood that the fan associated with the Sports Dome will operate over a 24-hour period. Calculations are therefore based on the lowest representative background noise level during a 24-hour operating period.

It is noted that fan unit contains a backup generator for emergency situations only, i.e. power cut or emergency fire alarm. The generator is serviced twice a year and is not used for any other purposes therefore has not been included in our assessment.

It is considered that the fan produces a broadband noise with no tonal features. The unit is also inverter driven, meaning that unit will gradually increase or decrease operating capacity depending on the level of duty required. This gives a positive indication that the noise produced is not immediate or distinguishable therefore no acoustic feature correction need be applied to the results.

Based on the lowest background noise level during the proposed operating period and the suggested design targets including any tolerance or correction factors, the following table shows the maximum permissible noise level from the condenser units when measured at the window of the nearest residential receptor.

Time Period	Representative Background, L_{A90}	Tolerance Factor	Correction Factor	Max Noise Level at Residential
Night (23:00 – 07:00 hours)	39 dBA	-10 dB	-0 dB	**29 dBA**

Table 5.1 - Plant Noise Level Targets

6.0 PLANT NOISE LEVEL ASSESSMENT

The fan associated with the inflatable Sports Dome is housed in a unit located to the southern end of the site as shown on the site plans in Appendix A.

In order to determine noise levels from the fan unit, a series of short term measurements were carried out at 1m from the unit in operation. The following table provides the highest measured average noise level from the unit and associated octave band data.

Measurement Position	Octave Band Centre Frequency, dB							
	63 Hz	125 Hz	250 Hz	500 Hz	1 K Hz	2 K Hz	4 K Hz	dBA
6	72.7	66.2	62.4	60.1	57.1	59.5	45.3	**64**

Table 6.1 – Highest Measured Plant Noise Levels

The nearest noise sensitive receptor is the upper windows of the residential flats located to the north of the site on Weedington Rd. Based on the location of the fan unit, the distance to the nearest residential window is estimated to be 36m. At this distance, the unit of plant is considered a point source and noise levels will decay at a rate of 6dB per doubling of distance.

Due to the orientation of the residential block of flats there is no direct line of sight between the fan unit location and window of nearest noise sensitive receptor therefore a barrier correction has been included in our calculations. A barrier attenuation of 10 dB is expected when the noise source is not visible from the receiver position.

Distance attenuation can be added to the attenuation provided by any barrier to give the overall attenuation. The following table provides the calculated noise levels from the fan unit when measured at 1m from the window of the nearest residential receptor.

	Octave Band Centre Frequency, dB							
	63 Hz	125 Hz	250 Hz	500 Hz	1 K Hz	2 K Hz	4 K Hz	dBA
Fan Unit	72.7	66.2	62.4	60.1	57.1	59.5	45.3	**64**
Distance	-31.1	-31.1	-31.1	-31.1	-31.1	-31.1	-31.1	
Barrier	-10	-10	-10	-10	-10	-10	-10	
SPL at Receiver	31.6	25.1	21.3	19.0	16.0	18.4	4.2	**23**

Table 6.2 – Calculated Plant Noise Levels

Calculations show that the noise level from the fan unit will be approximately **23 dBA** when measured at the nearest residential window. This does not exceed the target plant noise level of **29 dBA** established in Section 5.0 above therefore further mitigation will be required.

7.0 SUMMARY AND CONCLUSION

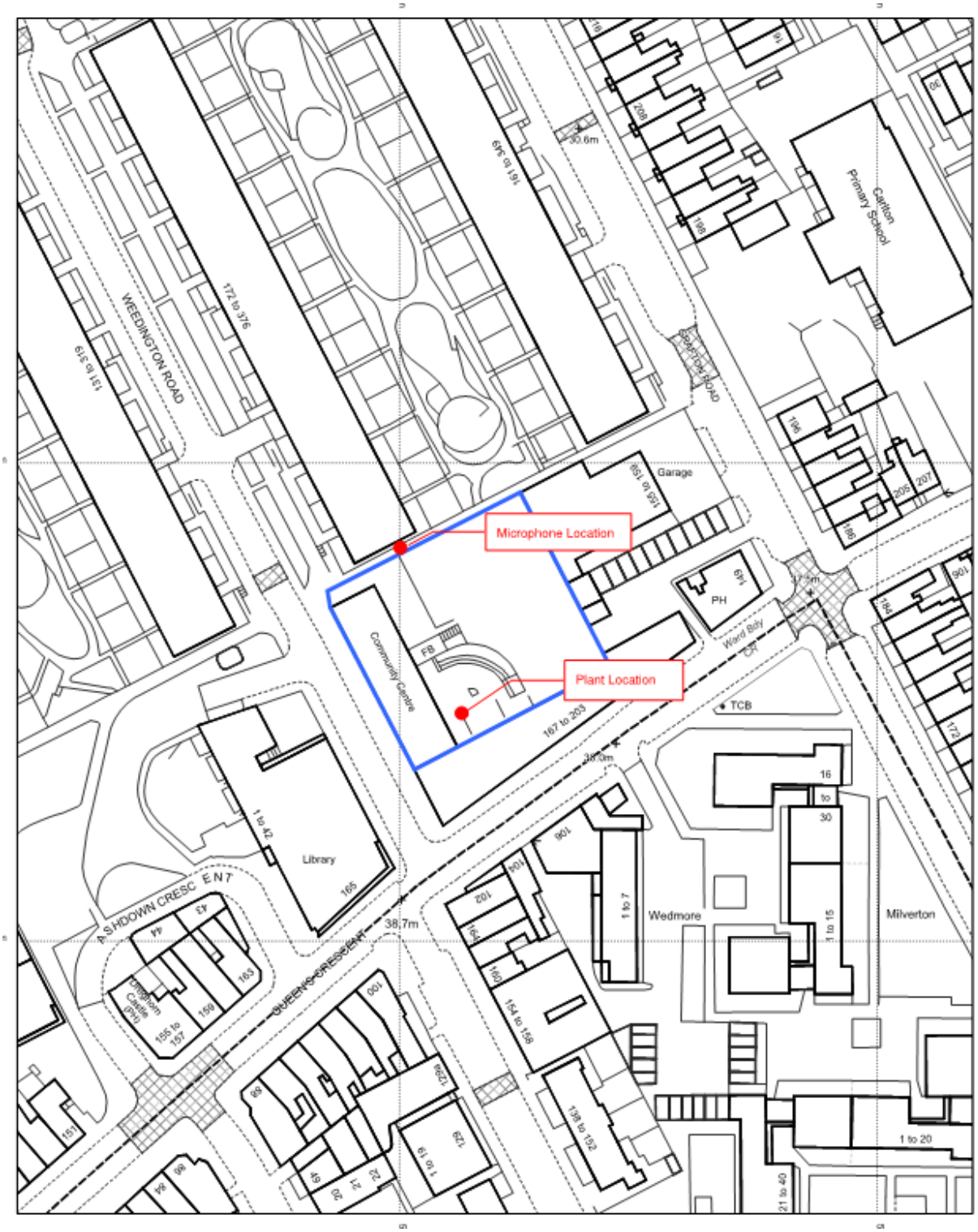
A noise survey was carried out at the proposed location of a fan unit associated with the Sport Dome at Weedington Road, London on 26 February 2019.

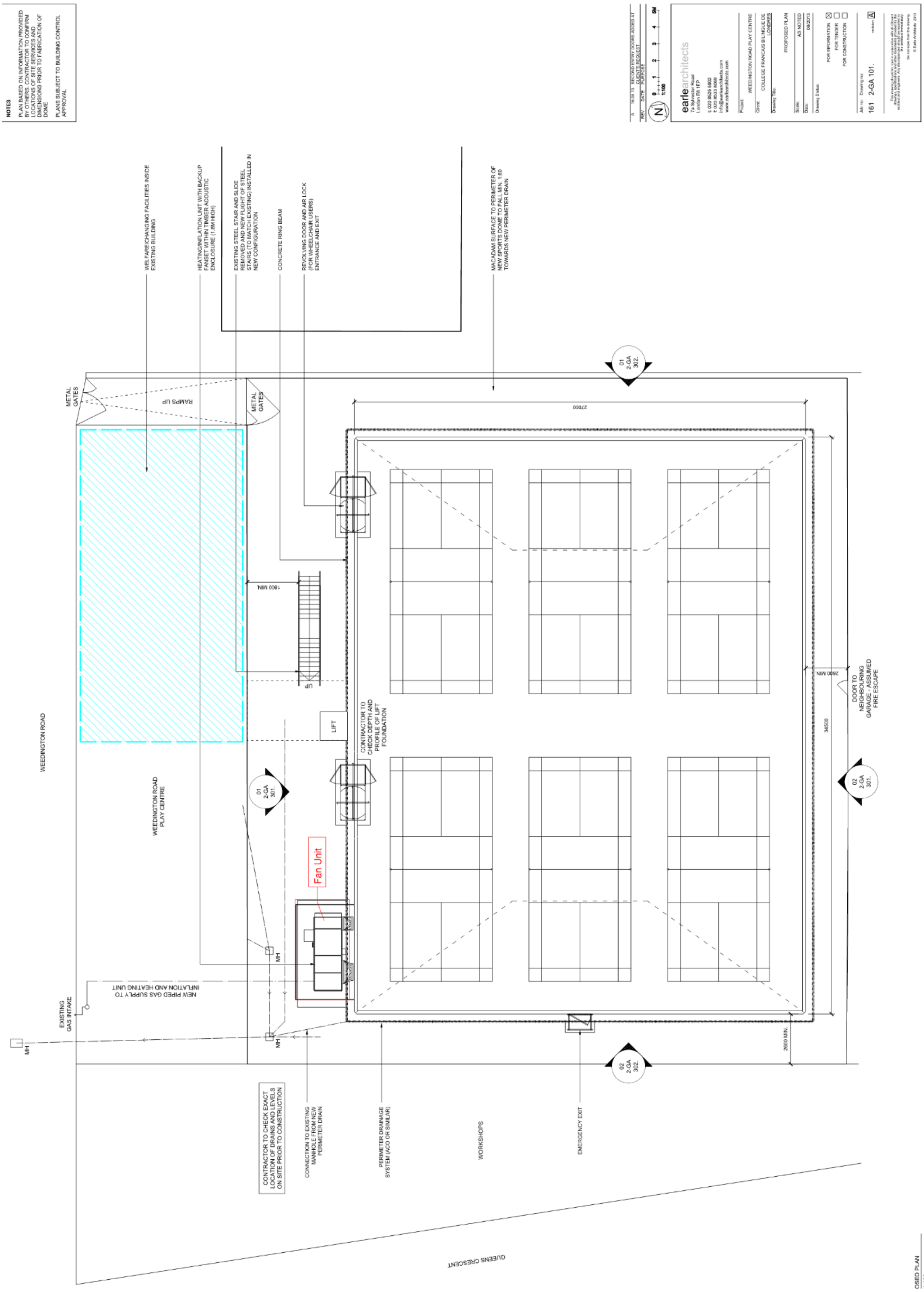
From this survey and previous measurement carried out, the minimum representative background noise level at the nearest sensitive property was determined to be 39 dB LA90 during the proposed operational hours.

Using guidance in BS 4142 and Camden Council planning policies, noise levels from the proposed condenser unit should not exceed 10 dBA below the background noise level at the window of the nearest residential dwelling.

Based on measured noise levels from the proposed plant, calculations show that noise levels at the nearest noise sensitive receptor would be approximately 23 dBA. This does not exceed the maximum permissible noise level target of 29 dBA which is a positive indication of low noise impact therefore no further mitigation will be required.

APPENDIX A – SITE DRAWINGS




Fan Unit
WEEDINGTON ROAD
WEEDINGTON ROAD PLAY CENTRE
QUEENS CRESCENT
WORKSHOPS
EMERGENCY EXIT
METAL GATES
RAMPS UP
LIFT
EXISTING GAS INTAKE
MH

APPENDIX B – SITE PHOTOS