PLANNING AND
BUILDING CONTROL
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BUREAU VERITAS

Acoustics and Vibration Group

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Jonathon Chapman
The Emerson Group
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Dear Jonathon,

Noise Impact Assessment - Parkway Business Centre, Manchester

Bureau Veritas have been requested by Jonathon Chapman of The Emerson Group to assess the potential noise impact of occupation of Unit 2, Parkway Business Centre, Manchester. It is understood that Unit 2 will shortly be occupied, and the tenants of the unit have requested that condenser units and back-up generators are supplied as part of the tenancy agreement. This assessment considers the likely noise impact on nearby noise sensitive properties.

Proposed Plant Items

Figure 1 attached shows the proposed location of plant items. Plant items within the compound will consist of 16 condenser units and 4 back-up generator units. It is understood that condenser units will operate 24 hours a day, however the generators will only serve as a back-up, therefore operational only during times of no or limited power to the unit.

Plant Noise Levels

The Emerson Group provided technical specifications of the condenser units and back-up generators. The preferred condenser unit is understood to be the C60HI-H, which has a noise level of 54 dB(A) measured at 10m. The back-up generator has a noise level of 75 dB(A) at 100% load, measured at 7m.

Nearest Residential Properties

The compound is approximately 50m from nearest noise sensitive dwellings (situated on Montcliffe Crescent). There is also some landscaping that helps screen Parkway Business Centre from these dwellings.

Background noise levels were measured for a 24 hour period between the 19th and 20th of January 2011. The lowest measured daytime and night-time background noise levels were 47 dB L_{A90} and 43 dB L_{A90} respectively. These noise levels were measured between 10 and 11am (daytime) and 0150 and 0155 on the 20th January (night-time).

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Methodology

Manchester City Council has not identified any specific assessment methodology or noise limits that should be met with respect to the impact of plant noise. Therefore Bureau Veritas has determined the noise impact of the north compound by assessing in accordance with BS 4142:1997, *"Method for rating industrial noise affecting mixed residential and industrial areas"*.

A description of the methodology for determining the noise impact in respect of BS4142 is given below. As no specific noise limits have been identified, Bureau Veritas considers that the L_{ArTr} (Rating Level) at nearest dwellings should not exceed 5 dB above the existing background noise level. This will be adopted as the criteria for this assessment.

BS4142:1997, "Method for rating industrial noise affecting mixed residential and industrial areas"

BS 4142 compares the Rating Level of the industrial noise under investigation with the Background Noise Level, both quoted to the nearest whole dB. The Rating Level is obtained by measuring or predicting the Specific Noise Level from the source, in terms of $L_{Aeq,T}$, and applying a correction factor to account for the acoustic character of the noise. The standard states that a correction of + 5dB must be applied if, *"the noise contains a distinguishable, discrete, continuous note (a whine, hiss, etc) or distinct impulses (bangs, clatters or thumps etc) or if its operation is irregular enough to attract attention"*. The Background Noise Level is the $L_{A90,T}$ measured in the absence of the industrial noise source.

The Background Noise Level ($L_{A90,T}$) measured is then arithmetically subtracted from the "Specific Noise Level". The difference between the two is considered to reflect the likelihood of complaints. The standard states the following:

"A difference of around +10 dB or more indicates that complaints are likely.

A difference of around +5 dB is of marginal significance.

If the rating level is more than 10 dB below measured background noise level then this is a positive indication that complaints are unlikely."

BS4142 Assessment

Table 1 below gives the unmitigated BS4142 daytime and night-time rating at the nearest noise sensitive properties resulting from the condenser units.

Table 1: Noise Impact of Condenser Units

	Daytime Assessment	**Night-time Assessment**
Condenser Noise Level	54 dB(A) @ 10m	54 dB(A) @ 10m
Number of Units	16	16
Distance to Properties	50m	50m
Predicted Noise Level at Properties	52.1 dB(A)	52.1 dB(A)
Character Correction	+ 5 dB	+ 5 dB
Background Noise Level	47 dB L_{A90}	43 dB L_{A90}
Unmitigated Rating Level	+ 10.1	+ 14.1
Unmitigated BS4142 Assessment	Complaints likely	Complaints likely

Please note that for the assessment of the condenser units, we consider them to have noise characteristics such as specific tonal elements. Therefore a + 5 dB correction has been added to the assessment. It should also be noted that we have used the lowest measured daytime and night-time background noise level measured during a typical 24 hour period, and therefore consider this to be a 'worst case' assessment.

The noise impact of the back-up generators is discussed later in this report.

Discussion

Condenser Units

Table 1 indicates that the unmitigated noise impact (when assessed in accordance with BS4142) is likely to give rise to complaints, both during the daytime and night-time. However, the assessment assumed there is no screening between the plant compound and Montcliffe Crescent. As stated previously, there is landscaping which screens the business park from these dwellings, and plans also indicate that the compound is to be surrounded by a closed board fence. Provided this fence is at least 2m high, it will completely screen the condenser units from dwellings on Montcliffe Crescent (the height of a condenser unit is 0.5m, and there is no significant ground level variation between source and receiver). Table 2 below is a revised assessment including the effect of mitigation.

Table 2: Noise Impact of Condenser Units after Mitigation

	Daytime Assessment	**Night-time Assessment**
Condenser Noise Level	54 dB(A) @ 10m	54 dB(A) @ 10m
Number of Units	16	16
Distance to Properties	50m	50m
Predicted Noise Level at Properties	52.1 dB(A)	52.1 dB(A)
Character Correction	+ 5 dB	+ 5 dB
Background Noise Level	47 dB L_{A90}	43 dB L_{A90}
Screening Effect	- 10 dB	- 10 dB
Mitigated Rating Level	+ 0.1	+ 4.1
Mitigated BS4142 Assessment	Less than marginal significance	Less than marginal significance

Table 2 indicates that with the screening effect resulting from landscaping and the compound fence, at worst the BS4142 assessment shows the noise impact from the condenser units has a 'less than marginal significance of complaints.

This rating of the noise impact is slightly unclear, so to clarify, this means the condenser units will be barely audible above the lowest background noise level, and this is unlikely to be at a level that people will consider unreasonable. Furthermore, measured daytime and night-time background noise levels throughout the 24 hr period indicated that in general they were some 3 – 5 dB higher than those used in the assessment, highlighting that the noise impact of the condenser units will in general be minimal.

Back-up Generators

Noise assessments of back-up generators are generally not required as part of planning applications, as these will only operate at times when there is little or no power being supplied. This is a very rare occurrence, and therefore it is considered unreasonable to apply the same level of importance on the potential noise impact, as for example, the condenser units

Consequently, Local Authorities often require that any tests that are undertaken on the back-up generators (to ensure they are still fully functioning) are limited to daytime hours, and for around 10 – 15 minutes maximum, once a week. It is suggested that this, or something similar, is adopted with respect to the back-up generators for Unit 2 and the Parkway Business Centre, as whilst it is likely the generators will be audible at nearby dwellings during tests runs, noise disturbance will be minimal.

Summary

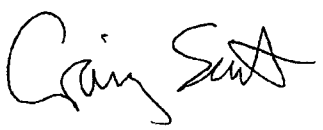
Bureau Veritas has measured existing background noise levels close to dwellings (Montcliffe Crescent) situated to the rear of Parkway Business Centre. Unit 2 of the business centre will soon be occupied, and as part of the tenancy agreement, a plant compound to the rear of the unit is to be introduced. This noise assessment has considered the potential impact of the plant items that will form the compound. The compound will contain condenser units and back-up generators.

The assessment indicates that without mitigation, the noise impact of the condenser units will likely give rise to complaints. With the introduction of mitigation (and considering the landscaping that is already there), the daytime and night-time BS4142 assessment indicates that there is a 'less than marginal significance of complaints'. This is based on the lowest measured daytime and night-time background noise levels, and as such is considered very to be a 'worst case' assessment.

With respect to the back-up generators, these will only operate at times when there is little or no power being supplied to Unit 2 of the Parkway Business Centre. Bureau Veritas considers that this would be a very rare occurrence, and consequently considers it unreasonable to apply the same level of importance on the potential noise impact of the back-up generators as the condenser units. It is accepted however that there will be periods of testing on the back-up generators required, in order to check they are still fully functioning. As such, in order to minimise noise disturbance, it is recommended that these tests are limited in terms of the amount of time i.e. 10 – 15 minutes maximum once a week, and also the time of day i.e. daytime hours only.

Any questions, please call.

Yours sincerely,



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Enc. Figure 1

Figure 1: Plant Compound

