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Environmental Noise Assessment
Proposed Industrial Development
Unit 9
Hummons Road Industrial Estate
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M12 5ST

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25 January 2010.



Introduction

AB Acoustics were commissioned by Mrs R Nazar to undertake an environmental noise assessment at Unit 9 Hummons Road Industrial Estate Manchester M12 5ST – it is proposed to convert the unit on the site to an MOT Test Station and garage.

Below is a plan of the site and the location of the nearest residential property near which the existing background noise levels were measured:



As can be seen the site is located in a residential area though within the old indudtrial premises are a number of working units – car repair / tile fitting and immediately adjacent to the proposed MOT station a unit manufacturing PVC double glazed windows – Network Windows.

Noise Assessment Criteria

The likelihood of complaints about noise from industrial plant can be assessed where the standard is appropriate using BS 4142 – 1997.

However, developments that have vehicular movements on and off site as part of their operation are not fully covered by BS 4142 – this is because cars and commercial vehicles are not fixed installations and are not sources of industrial noise.

Within the standard, another Standard, BS8233-1999 is introduced for general guidance on acceptable noise levels within buildings.

Guidance in BS 8233 – 1999 (Sound Insulation and Noise Reduction in Buildings) provides design criteria for noise inside dwellings. These are:

Bedrooms: LAeq,T = 30 dBA
Living Areas: Laeq,T = 35 dBA

The 30 dB to 35 dB LAeq,T design level in BS 8233-1999 is in line with the night-time internal noise criteria in PPG 24 of 35 dBA. This level is acceptable as avoiding disturbance to sleep.

The internal criteria of 30 LAeq,T 5 mins would translate to an outdoor limit of 45 dB LAeq,T 5mins where, by conversion, an open window would provide an attenuation of 15 dBA.

The BS 4142 assessment method considers the likelihood of noise from specific sources provoking complaints from residents of nearby sensitive properties.

The Specific Noise Level is the noise level of the source or collection of sources under investigation and should exclude any other noise sources that may otherwise contribute.

The likelihood of complaints is assessed by comparing the noise level from the specific noise source(s) under investigation against typical prevailing background noise levels. The audible characteristics of the specific noise source(s) are also taken into account, ie. if the noise contains any distinct hums, whines, bangs etc then a correction of + 5 dBA should be added to the measured level . This then becomes the Rating Level.

The margin by which the noise level due to the specific noise source under investigation exceeds the background level enables the likelihood of complaints to be assessed.

1 The greater this difference, the greater the likelihood of complaints.

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

3 A difference of + 5 dB is of marginal significance

4 If the Rating Level is more than 10 dB below the background level, this is a positive indication that complaints are unlikely.

Also relevant are the World Health Organisation (WHO) Guidelines for Community Noise – these identify that sleep may be disturbed by short term noise events and the level associated with this is 45 dB LAmax inside the bedroom – this relates to 60 dB LAmax external to the bedroom.

In brief an 'Outdoor Living Area' should be subject to a noise level less than 55 dBA in order to prevent serious annoyance during the daytime and evening - a level less than 50 dBA is desirable to prevent moderate annoyance : reference World Health Organisation.

Equipment Used and Measurement Method

The noise levels were measured using a :

Norsonic Type 114 real Time Octave Band Analyser (type 1 instrument)

Calibration was carried out prior to the measurements – and checked afterwards using a ;

Norsonic Acoustic Calibrator.

The measurements were carried out at the locations described at a height of 1500mm above the ground and away from reflecting surfaces.

The measurements were undertaken at the times stated in the results.

Results

These are tabulated below :

The initial background measurements were undertaken at the times stated .

Monday 18 January 2010. – damp – air temperature = 8^0 C – 0.0 m/sec wind - damp roads

Time	L_{A10}	L_{A90}	LA_{eq}
10.15 – 11.15	52.3	**46.3**	49.1
13.15 – 14.15	56.1	**45.5**	53.0
15.25 – 16.25	55.9	**44.9**	53.0

As can be seen from the above the LOWEST L_{A90} measured was **44.9 - 45 dBA** – this is the level that the following calculated Rating Levels are compared to determine the likelihood of complaints from the residents of the nearby residential properties.

In addition to the general activity within the garage and the MOT testing area there will be some vehicle movement – this has been included in the measurements at the sites detailed below .

The nearest residential property has been scaled at a distance of 43m From the facade of Unit 9 and is considered to be No. 66 Hummons Road

MOT

Measurements have previously been undertaken at a garage – Canterbury MOT Centre – 2 / 16 Canterbury Street Blackburn – that undertakes similar work to that proposed at the above (testing Class 4 & 7 vehicles – private cars and vans)

The measurements were undertaken of an MOT on a Ford Ghia Estate – an MOT lasts an average of 59 minutes– during this time there are a number of noisy operations – hammering / operation of ramp etc – and quiet periods – testing of lights – visual examinations etc.

The noise level was measured at a distance of 2.0m from the work area with the following results :

Overall Level	Octave Band Centre Frequencies Hz						
dBA	63	125	250	500	1000	2000	4000
65.2	42.3	48.4	56.3	62.8	61.2	60.9	59.2

Therefore this is used to determine the Rating Level at the nearest residential property.

Essentially the noise from the activities will be escaping via the access door.

The scaled distance from the door area to the residential property is approximately 43m – in addition to this the work area within the building is at least a further 9m inside the building – at this distance the source can be regarded as a point source as its dimensions are small in comparison to the distance between the source and the receiver.

The measured level of 65 dBA was measured at a distance of 2.0m from the source – therefore the level at distance R can be calculated using :

$$L_2 = L_1 - 20\log R/r \text{ ref}$$

Where L_2 = level at distance r metres
L_1 = level at ramp = 65 dBA
R= distance of working garage to residential property = 43 + 9 = 52m
ref = 2

$$L2 = 65 - 20 \log 52/2$$

L2 = 37 (36.7) dBA

Service Work

Measurements were undertaken at Canterbury MOT Centre – 2 / 16 Canterbury Street Blackburn.

At the time of the measurements two cars were being serviced / repaired – which involved the use of a pneumatic gun to remove wheel nuts – general work on the cars – some banging and the use of the hydraulic ramps to lift the car off the ground – four staff where working in the area and the radio was on.

The noise level was measured at a distance of 2.0m from the work areas with the following results :

67.5	36.9	43.3	51.8	60.2	60.6	62.2	60.9

The above measurement was taken over a period of 24 minutes.

Additional measurements have also been taken at Kingscliffe Garage, Kingscliffe Street Moston Manchester :

At the time of both sets of measurements a car was being worked on – firstly the exhaust was being replaced and during the second set of measurements the car was being prepared for an MOT.

10.05 – 11.05

Hammering – air tools – ramp operative

Measurement carried out at a distance of 2.0m from the ramp/car.

Overall Level	Octave Band Centre Frequencies Hz							
dBA	63	125	250	500	1000	2000	4000	8000
60.2	32.4	37.0	47.2	53.6	53.7	55.0	51.4	42.4

13.37 – 14.37

As above but the compressor ran for longer – this appeared to be the main source of continuous noise.

64.2	42.3	46.6	52.7	57.8	60.4	57.6	55.6	47.9

Therefore if the first measurement is taken as the *worst case situation* then this is used to determine the Rating Level at the nearest residential property.

$L_2 = L_1 - 20\log R/r$ ref

Where L_2 = level at distance r metres
L_1 = level at ramp = 68 dBA
r. = distance of working garage to residential property = 43 + 9 = 52m
ref = 2

L2 = 68 – 20 log 52/2

L2 = 40 (39.7) dBA

Initially it is only intended to use the garage for car servicing etc. and possibly extend its use to an MOT station at a later date – if this is the case then the calculated Specific Noise Level for the operation of the garage is **40 dBA** – due to the noise character of the operation then a + 5 dBA correction factor needs to be added to this level resulting in a Rating Level of 40 + 5 = **45 dBA**

If this level is compared to the lowest measured background noise level of **45 dBA** it is seen that the Rating Level due to the use of the garage is equal to the measured background level – this is an indication that complaints about noise are unlikely to be received.

If the use of the unit is extended to both a garage and an MOT station then it is likely that both operations will occur at the same time therefore the above calculated Specific Noise Levels for the two operations need to be summed – **40 (garage) + 37 (MOT) = 42 (41.7) dBA**

Due to the noise character of the operation then a + 5 dBA correction factor needs to be added to this level resulting in a Rating Level of 42 + 5 = **47 dBA.**

If this level is compared to the lowest measured background noise level of **45 dBA** it is seen that the Rating Level due to the use of the garage and the MOT Station is + 2 dBA ABOVE the measured background level – this is a indication that complaints about noise are unlikely to be received as the Rating Level is below that which is considered to be of *marginal significance* with respect to BS 4142.

All the above calculations assume that NO work is undertaken externally to the premises.

The above calculations assume direct line of sight from the receiver to the noise source – this will not be the case for all the neighbouring residential properties – there will be some degree of screening from the building itself.

According to BS 5228 : Part1 : 2009 Section F.2.2.2.1 Section C an attenuation to the noise from this source of the order of 5 / 10 dBA expected – therefore the noise level at the residential property could be reduced by around 5 dBA.

The properties to the North and South of the proposed garage are screened from the operations by the adjacent properties and therefore the noise contribution from the garage will be insignificant.

To the East of the proposed development is vacant land.

Recommendation

The Planning Application for the 'new' garage is approved.

No work must be undertaken externally to the building.

The compressor – which is likely to be4 the main source of continuous noise be sited at the rerar of the proposed unit.

Roger Leach AMIOA

Dated : 25 January 2010