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REPORT

of

SOUND MEASUREMENTS AND CONCLUSIONS

at

PROPOSED ELECTRIC KART TRACK,
BEEVOR STREET,
OFF PONTEFRACT ROAD,
BARNSLEY
S71 1HN.

Date of measurements:	16th March 2011
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1.0 Summary and Conclusions

It is proposed to locate a track for electrically powered karts on a site previously used as a lorry park at Beevor Street, Barnsley. As part of the planning application the Local Planning Authority has called for a survey and report on the potential noise impact of the kart track on the nearest residential properties.

Sound levels were measured as part of this survey at the track when being used by an electric kart of the type proposed for use if permission is granted. The results are used as base data for predictions of the sound levels reaching the nearest dwellings, and are compared to the usual acceptance criteria.

1.1 The sound levels outdoors at the nearest dwellings caused by maximum utilisation of the kart track is predicted at 30 dB LA_{eq}.

1.2 The background sound level during a weekday morning was measured at the dwellings at 43.8 dB LA_{90}.

1.3 After adding 5 dB to the kart sound level to account for its character, its predicted rating level was 9 dB below the background at the nearest dwellings.

1.4 The conclusion of a BS 4142 assessment is that the results are "a positive indication that complaints are unlikely" about sound from the kart track during weekday daytime periods. Although the background sound level may be lower than the measured value at some times when the kart track is in use it is anticipated that the kart sound will be significantly below the background at all times.

1,5 Guidance provided in PPG24 'Planning and Noise' is that Local Planning Authorities may consider it reasonable to permit higher noise emission levels for recreational developments than they would from purely commercial or industrial development. This guidance suggests that the BS 4142 assessment of sound from the kart track area may be more favourable than for an industrial application with the same rating levels.

2.0 Planning Requirements on Noise

As a starting point this report uses the noise rating method of BS 4142 as referred to in PPG24. These documents are summarised below for convenience.

2.1 PPG24 'Planning and Noise'

Guidance to local authorities on the considerations of noise affecting dwellings was issued in 1994 as Planning Policy Guidance 24: 'Planning and Noise'. Paragraph 19 of Annex 3 deals specifically with noise from industrial or commercial developments near to existing dwellings. The basic assessment method called for is a complaints rating to BS 4142.

2.2 BS 4142: 1997

The method recommended by BS 4142 is to measure outdoor sound levels at dwellings during the emission of noise from the industrial or commercial premises under investigation and measure the background level at the same location in the absence of the industrial noise. A correction factor is applied if appropriate to the measured levels for some specific factors which affect its acceptability, described as "a distinguishable, discrete, continuous note (whine, hiss, screech, hum, etc.) or if there are distinct impulses in the noise (bangs, clicks, clatters, or thumps), or if the noise is irregular enough in character to attract attention".

The corrected measured level, the rating level, is compared with the background from which it is concluded that:

- complaints are likely if the rating level exceeds the background by around 10 dBA or more,
- a difference of around 5 dBA is 'of marginal significance',
- if the rating level is more than 10 dB below the background level then this is a positive indication that complaints are unlikely.

2.3 Application to Recreational Activities

BS 4142 is primarily intended for assessing noise from industrial and commercial premises. When assessing noise from recreational and sporting developments PPG24 advises, "Depending on local circumstances and public opinion, local planning authorities may consider it reasonable to permit higher noise emission levels than they would from industrial development..." In accordance with the PPG24 guidance the LPA may allow a higher BS 4142 rating from this source than would be permitted from purely industrial or commercial noise sources.

3.0 Sound from Electric Karts

3.1 Sound Measurements

Sound levels were measured at an average distance of 5m from an electric kart when being driven by an experienced driver at full speed around a route which would be typical of a kart track on the former lorry park at the application site. The sound levels at 5m were:

Sound Descriptor		Kart Racing	No Kart
Ambient	LA_{eq}	63.4	44.4
Maximum	LA_{max}	75.6	50.3

A full set of sound measurements including frequency spectra were taken and are stored on disk if required. A Bruel & Kjaer 2250 sound analyser was used for which current calibration certificates are held. Conditions during the survey period were dry with no wind, being suitable for outdoor sound readings.

3.2 Noise-Sensitive Receptors

The nearest residential properties to the proposed location of the kart track are on Falmouth Close at 430m distance. There is a direct line of sight from the dwellings to the kart track site across the Dearne Valley Park, broken only by trees.

3.3 Sound Predictions at Nearest Dwellings

Sound decay over the outdoor distance from the measurement position at 5m from the kart to the dwellings at 430m is given by:

$$\text{decay} = 20 \log (430 / 5) \text{ dB} = 39 \text{ dB}$$

There will some absorption of sound provided by the vegetation of the Park but its value will depend on the height of the sound path above the ground surface. Since the height is unknown at this stage the effect of ground absorption is ignored in this prediction, giving a conservative tolerance margin to the predicted sound at dwellings.

The predicted sound level at the dwellings caused by one kart is 63-39 = 24 dBA. There will usually be a maximum number of 8 to 10 karts using the track at any time giving a predicted sound level of 33 dBA at the dwellings when all karts are running together.

There will be no other sound sources at the kart track affecting the outdoor environment. There will be no public address system or playing of music. Maintenance activities on the karts will be carried out inside a workshop.

4.0 Assessment of Sound Level at Dwellings

Specific Noise Level

The method of BS 4142 assesses outdoor sound over any period of one hour during the daytime. The maximum utilisation of the kart track will be 30 minutes in an hour. When the sound level from the karts is spread over a one hour period the time-average value of the sound level at the dwellings will be 30 dB LA_{eq} (1-hour).

Noise Rating Level

The character of sound from the karts is intermittent and tonal such that a correction of 5 dBA must be added for the character of noise under the rating method of BS 4142. The noise rating level is 35 dB.

Background Comparison

The method of BS 4142 rates the likelihood of complaints by comparing the rating levels at the dwellings with the background LA_{90} levels. The background sound level at the dwellings at the time of our

site meeting with representatives of the LPA on 16th March 2011 was measured at 43.8 dB LA_{90}. Comparison between the noise rating level and the background at the time of our meeting shows the sound from the kart track to be:

9 dB below the background at the nearest dwellings.

The background level was measured for convenience at the time of our meeting with the LPA during a weekday morning. This may not be the time of the lowest background sound levels but it is believed to be indicative of the complaints potential. It appears most unlikely that the background would fall as below 35 dB LA_{90} at any time when the kart track will be in use, so it is predicted that the rating level will be below the background at all times.

BS 4142 Conclusions

The conclusions of this survey by the guidance of BS 4142 is that sound from the kart track will be rated below the background at all times, and around 10 dB below the background at some times. The latter situation is "a positive indication that complaints are unlikely".

In reaching a conclusion about this particular sound source of a recreational nature it is suggested that the guidance of PPG 24 should be borne in mind, ie. "Depending on local circumstances and public opinion, local planning authorities may consider it reasonable to permit higher noise emission levels (from recreational activities) than they would from industrial development."
