

8. NOISE

8.1 Introduction

8.1.1 The purpose of the noise assessment is to quantify the potential noise impact from the proposed development. The aspects considered are:

- the noise from construction activities,
- the effect of additional road traffic in the operational phase, and
- spectator and activity noise.

8.2 Methodology

8.2.1 Noise measurements and interpretation has been made in accordance with the guidance contained in:

- Planning Policy Guidance 24 (1994) *Planning and Noise* (PPG24);
- Planning Policy Guidance 17 (2006) *Planning for open space, sport and recreation*;
- Sport England (1999) *Planning Policies for Sport - A Land Use Planning Policy Statement on Behalf of Sport*;
- Department of the Environment (1993) *Calculation of Road Traffic Noise* (CRTN); and
- Institute of Acoustics/Institute of Environmental Management and Assessment Working Party *Guidelines for Noise Impact Assessment (2002) (Draft Report)*

Guidance on noise generated at sporting activities

8.2.2 Although PPG24 recommends specific guidance notes for the assessment of noise from most commonly encountered noise sources, it gives little specific advice in the assessment of noise from sporting events. It does state that the “*impact of noise from sport, recreation and entertainment will depend to a large extent on frequency of use and the design of facilities.*”

8.2.3 PPG24 advises that the “*local planning authority will have to take account of how frequently the noise will be generated and how disturbing it will be, and balance the enjoyment of the participants against nuisance to other people.*” PPG24 goes on to state that “*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, subject to a limit on the hours of use, and the control of noise emissions (including public address systems) during unsocial hours.*”

- 8.2.4 PPG24 recognises that many sports' governing bodies also give specific guidance on the noise impact from sporting activity and refers to PPG 17 Planning for open space, sport and recreation.
- 8.2.5 PPG17 however, offers little advice on noise from sporting activities, other than its recommendation that noisy sports in designated areas such as National Parks or Areas of Outstanding Beauty should be restricted to "*locations where they will have minimal or no impact on residents or other recreational users.*" This site has no such designation.
- 8.2.6 Sport England's guidance defines noisy sports as including "*shooting, motorsports, powered air sports, water skiing and the use of personal water craft.*" Football is not listed as a significant sporting noise source.
- 8.2.7 The principal noise source from the development is therefore considered to be road traffic; the assessment methodology in CRTN therefore provides the most appropriate guidance for assessing the potential noise impact associated with the changes in road traffic noise from the development. CRTN provides procedures to calculate either 1-hour or 18-hour road traffic noise levels, principally based upon the number of vehicles traversing the road, the proximity of the prediction location to the road and attenuation from landform or barriers. As the development is proposed to operate during the morning on a weekend, the assessment has been made as a 1-hour road traffic noise level for each of the identified operational hours.

Assessment Criteria - Road Traffic

- 8.2.8 The significance of the indirect noise impact at the noise sensitive properties on from additional road transport can be judged using the criteria summarised in Table 8.1. These criteria have been derived from relevant guidance contained in the Institute of Acoustics/Institute of Environmental Management and Assessment Working Party *Guidelines for Noise Impact Assessment (2002) (Draft Report)* and the Design Manual for Roads and Bridges.

Category	Change in dB (L_{A10}, 1 hour)	Subjective response	Subjective scale of noise level change	Significance of road traffic noise impact.
Major Adverse	Increase of 10.0 dB(A) or more.	More than a doubling of loudness	Severe Change	Significant.
Moderate Adverse	Increase of 5.0-9.9 dB(A)	Up to a doubling of loudness	Substantial Change	Moderately Significance
Minor Adverse	Increase of 3.0-4.9 dB(A)	Perceptible	Moderate Change	Minor Significance
Slight Adverse	Increase of 0.1 - 2.9 dB(A)	Slight probability of being perceptible	Minimal Change	Insignificant
No impact	Increase of 0-0.1dB(A)	Imperceptible	No change	Insignificant

Assessment Criteria - Football Activity

8.2.9 There are no recognised criteria from which a judgement of the significance of the noise impact from a sporting event can be made. In the absence of specific criteria, the Institute of Acoustics / Institute of Environmental Management and Assessment approach, as summarised in Table 8.1, can also be applied to classify the potential impact and to assess the significance of the noise impact from the sporting activity over baseline noise conditions.

8.3 Baseline Noise Survey

8.3.1 The noise monitoring locations shown on Figure 8.1 are “free field” locations that are considered to be representative of the closest noise-sensitive properties to the proposed development.

8.3.2 A baseline noise survey carried out at Coaley Lane and Staddon Way on Sunday 13th January 2008, over the hours when the proposed development would operate, namely 1100 to 1400. Following discussions with Sunderland City Council’s Environmental Health Officer, a further baseline noise measurement was undertaken at Chestnut Terrace. Baseline measurements were carried out at Chestnut Terrace on Sunday 16th March 2008; weather conditions precluded accurate measurement over the period 1100 - 1400, but a single hour over the period 1600 - 1700 was measured, when wind speed dropped to allow an accurate measurement of the baseline noise environment.

8.3.3 Monitoring of baseline noise levels in the absence of the development were undertaken on a Sunday as ambient noise levels tend to be lower so this represents a worst case scenario. The assessment has been made for both days but it should be recognised that Saturday baseline noise levels are likely to be higher.

8.3.4 Measurements were made using the following equipment:

- Brüel and Kjær 2250 Type 1 Sound Level Meter, with Sound Level Meter Software BZ 7222;
- Brüel and Kjær Microphone Type 4189;
- Brüel and Kjær Microphone Preamplifier ZC0032;and
- Brüel and Kjær UA1650 90 mm diameter Windscreen with AutoDetect.

8.3.5 The sound level meter was mounted on a tripod, with the microphone at grazing incidence (horizontal to the ground) in a freefield position as prescribed in CRTN.

8.3.6 A note was made of the sources of noise, which contributed to each of the measured levels. The dominant noise source during each measurement was road traffic noise on Coaley Lane and Staddon Way, with distant road traffic from the wider road network also influencing measurements. Other noise sources included birdsong and motorbikes being ridden in the field identified for the proposed development.

Baseline Noise Survey Results

8.3.7 The monitoring results from the noise survey are summarised in Table 8.2

Position	Time	Measured freefield noise levels dB(A)		
		L _{Aeq,T}	L _{A10,T}	L _{A90,T}
1 Coaley Lane	1100 – 1200	55.3	58.7	48.2
	1200 – 1300	56.7	59.8	49.5
	1300 – 1400	61.2	63.3	54.2
	Mean (3-hours)	57.7	60.7	49.9
2 Staddon Way	1100 – 1200	55.6	59.1	47.0
	1200 – 1300	55.7	60.0	46.9
	1300 – 1400	55.9	59.7	44.5
	Mean (3-hours)	55.7	59.5	46.0
3 Chestnut Terrace	1600 - 1700	60.3	64.6	47.1

8.3.8 The calculation of road traffic noise levels using the existing and development road traffic flow, using the procedures in CRTN for the calculation of changes in road traffic noise levels, is presented in Appendix 8.2 and summarised in Table 8.3. The predictions have been made for the residential properties in closest proximity to the baseline noise monitoring locations.

Table 8.3			
Predicted road traffic noise levels			
Position	Time	Baseline Road Traffic Noise	
		L _{10,1hour} dB(A)	
		Predicted	Measured
1 Coaley Lane (East)	1100 – 1200	59.4	58.7
	1200 – 1300	60.6	59.8
	1300 – 1400	59.0	63.3
2 Staddon Way	1100 – 1200	55.4	59.1
	1200 – 1300	56.0	60.0
	1300 – 1400	54.8	59.7
3 Chestnut Terrace	1100 – 1200	60.4	}
	1200 – 1300	61.2	}
	1300 – 1400	59.6	}
Predicted noise levels based on data supplied by Jacobs, reproduced as Appendix 8.1			

8.3.9 Comparison of the measured baseline noise levels with the predicted baseline road traffic noise levels demonstrates that the direct road traffic noise does not account for the entire measured baseline noise environment at Staddon Way, although there is a good overall comparison at Coaley Lane. The calculation has been made assuming 0% HGV on the adjacent road network, with the closest road section to each house on a level gradient over the angle of view to that section. The measurements at Chestnut Terrace do not relate to the 1-hour periods used to predict the traffic flow and so cannot be compared directly. It is evident from the measurement that existing road traffic noise levels were higher than predicted using the traffic flow data.

8.3.10 The calculation of road traffic noise has considered the roads passing directly in front of the identified houses as being the principal noise source by virtue of their proximity to the source. However, it is clear that other noise sources such as the road traffic noise from the wider transport network were also contributing to the baseline noise environment on Staddon Way, where the predicted component from the road traffic passing the property was less than the measured noise levels.

Activity Noise (Spectator and Players)

8.3.11 In order to assess the impact of noise emissions from both spectator and player noise, representative noise measurements have been recorded. The representative measurements were taken at Ford Quarry, Sunderland while all six football pitches at the site were in use. The measurements were taken on Saturday 5th April 2008. Measurement data is contained within Appendix 8.3.

8.3.12 Table 8.4 shows the noise emissions from spectators and players at Ford Quarry, Sunderland, a similar set of football pitches run by the Applicant.

Table 8.4 Football game noise levels (dB)			
Day and Time	Number of Pitches in use	Distance from closest Pitch (m)	Measured Noise level $L_{Aeq,T}$ dB(A)
05/04/08 10.21 - 10.36	6	25	60.4

8.3.13 The measurement of activity noise at Ford Quarry, Sunderland was carried out at 25m from the closest pitch, this was to ensure that the measurement included noise from all six pitches while maintaining player and spectator noise as the dominant source with the microphone in a free-field position.

8.3.14 The proposed Newbottle site will contain 20 football pitches, it is expected that at most 12 pitches will be played while the remaining pitches are rested at any one time. In order to allow some flexibility and assess a very worst case scenario, the assessment considers the impact from 12 football pitches in simultaneous use, i.e. twice as many pitches as measured at Ford Quarry.

8.3.15 Therefore to determine the impact noise from 12 football pitches at 25m the measured value is therefore increased by 3dB(A) to $L_{Aeq,T} = 63.4\text{dB(A)}$. (This because doubling of noise equates to addition of 3dB(A)).

8.4 Assessment

Construction Noise

8.4.1 Construction methods have not yet been finalised, although construction activity at the site could be audible at the identified properties. Any noise impact associated with site establishment and construction would be temporary and strictly controlled to minimise the impact at the existing residential properties. Condition 12 requires a scheme to be submitted to the Planning Authority to protect local amenity. This has been discharged.

Road Traffic Noise

8.4.2 Noise levels from the expected additional road traffic to the development have been calculated using the procedures specified in CRTN. The additional traffic flow associated with the development is summarised in Table 8.5, as supplied by Jacobs Consultancy (See Appendix 8.1).

Position	Time	2-way traffic flow	
		Existing	Existing + Development
1 Coaley Lane (East)	1100 - 1200	336	588
	1200 - 1300	437	508
	1300 - 1400	304	426
2 Staddon Way	1100 - 1200	148	483
	1200 - 1300	170	255
	1300 - 1400	128	335
3 Chestnut Terrace	1100 - 1200	336	483
	1200 - 1300	437	451
	1300 - 1400	304	351

Data supplied by Jacobs , as reproduced in Appendix 8.1

8.4.3 The calculated noise levels associated with the development road traffic, calculated by applying the procedures in CRTN using the traffic data summarised in Table 8.6 are summarised in Table 8.6.

Position	Time	Road Traffic Noise Impact		
		L _{10,1hour} dB(A)		
		Predicted	Measured Baseline	Predicted - Measured Baseline
1 Coaley Lane (East)	1100 - 1200	61.5	58.7	2.8
	1200 - 1300	61.2	59.8	1.4
	1300 - 1400	60.4	63.3	-2.9
2 Staddon Way	1100 - 1200	60.6	59.1	1.5
	1200 - 1300	57.8	60.0	-2.2
	1300 - 1400	59.0	59.7	-0.7
3 Chestnut Terrace	1100 - 1200	61.6	} 64.6	-3.0
	1200 - 1300	61.3		-3.3
	1300 - 1400	60.3		-4.3

8.4.4 The prediction demonstrates that the road traffic noise from the additional vehicle movements to the development would be no more than 2.8dB(A) over measured baseline noise levels. Using the significance criteria in Table 8.1 this increase is assessed as slight adverse with only a slight probability of being perceptible.

8.4.5 The proposed development would lead to a short term increase in traffic noise over the identified hours. In isolation the greatest increase in road traffic noise of 5.1dB(A), is predicted on Staddon Way for the period 1100-1200. However, when the ambient noise level is considered, the increase over the existing baseline noise levels is calculated to be 1.5dB(A). Such a noise impact is assessed as being slight adverse with a slight probability of being perceptible.

Spectator and Activity Noise

8.4.6 There are no applicable specific criteria for limiting the noise impact from sporting events, and there are no specific assessment methods for assessing noise from small football grounds such as those proposed with the development. However, the absence of any specific guidance on assessing the acceptable noise impact from sporting activities does not mean that such impacts are unimportant.

8.4.7 The impact of the activity noise from the spectators and players can be calculated back to the closest properties on Staddon Way and Coaley Road using the following equation for the radiation of sound from a point source.

$$L_2 = L_1 - 20 \text{Log} \frac{r_2}{r_1}$$

Where

L_1 = the measured noise level;

L_2 = the predicted noise level at the property;

r_1 = the distance between the sound level meter and the noise source; and

r_2 = the distance between the property and the noise source.

8.4.8 Table 8.7 shows the impact of the noise emissions from spectators and players using 12 pitches. The calculations can be found in Appendix 8.4.

Table 8.7						
Football game noise levels (dB)						
Location	Distance from closest Pitch (m)	Daytime ¹ Background Noise level $L_{A90,T}$	Activity noise level $L_{Aeq,T}$	Barrier Correction	Resultant activity noise level $L_{Aeq,T}$	Impact over background $L_{Aeq,T} - L_{A90,T}$
1 Staddon Way	94	46.0	51.9	-5	46.9	0.9
2 Coaley Lane	71	49.9	54.3	-5	49.3	-0.6
3 Chestnut Terrace	89	47.1	52.4	-5	47.4	0.3

¹Daytime hours are 0700 to 2300 as specified in PPG24

8.4.9 The noise impact from the use of 12 football pitches simultaneously on Coaley Lane is below the current background L_{A90} noise levels. At the remaining identified properties, the impact is between 0.3dB(A) and 0.9dB above the measured background noise levels, $L_{A90,T}$.

8.4.10 The Institute of Acoustics/Institute of Environmental Management and Assessment Working Party document describes impacts below 0dB to be considered as having no impact upon the baseline noise levels. It also describes an increase of between 0.1 and 2.9 dB as having a slight impact on baseline noise levels. It is therefore considered that the activity at the proposed Newbottle site will have no impact upon Coaley Lane. The impact upon the identified properties on Staddon Way and Chestnut Terrace are assessed as being slight adverse with a slight probability of being perceptible.

8.5 Mitigation

8.5.1 Construction noise could be controlled by means of a Prior Consent Notice, issued under Section 61 of the Control of Pollution Act 1974. Condition 12 has been imposed by the Local Authority, to limit site noise to acceptable levels and to limit operating hours, in order to minimise noise impacts. This condition has been discharged.

8.5.2 PPG24 requires that mitigation of noise from sporting activity can be achieved through the limiting of time the development is used and controlling noise emissions including public address systems during unsocial hours. The development would not use a public address system, and does not take place during unsocial hours, normally recognised as the night time period 2300 - 0700 defined in PPG24. Any direct noise from the use of the development would be attenuated by the natural landform, which dips away from the residential properties, and the specific mitigation measures already in place to mitigate the impact from road traffic noise as described in the following paragraphs.

8.5.3 The access to the proposed development is made from Staddon Way, which has been designed to be part of the Newbottle bypass (See Section 9 Paragraph 9.1.7). Development of this road has been made on a piecemeal basis, by housing developers as Planning Commitments agreed with Sunderland City Council. Sunderland City Council still has an aspiration to complete the route, continuing to construct it in a piecemeal fashion with subsequent development in the area, therefore Staddon Way will eventually be part of the Newbottle bypass. The acoustic mitigation infrastructure is therefore in place at Staddon Way with earth bunds at the junction with Coaley Lane, and close-boarded timber fences to the gardens further north on Staddon Way.

8.5.4 The baseline noise measurements were taken on public land, and therefore did not include the acoustic attenuation these barriers provided to the residential properties. The magnitude of the road traffic noise experienced at the residential properties would therefore be less than the noise levels calculated with this assessment.

8.5.5 If or when the Newbottle bypass does open, the increase in road traffic legitimately using that road would increase the traffic noise levels experienced at the residential properties, in particular those facing Staddon Way. The impact from the proposed development would then become less significant.

8.5.6 It should be noted that it is apparent that when the housing along Warrington Close, Torrington Close and Devonport was constructed, measures were put in place to protect the properties from future noise from the highway. There is an earth mound between Devonport and Staddon Way and the rear fences of the properties along Warrington Close, and Torrington Close have close boarded timber fencing approximately 1.8m high. These features act as a noise barrier.

8.6 Conclusion

8.6.1 The road traffic noise from the proposed development has been assessed and the impact over the current traffic flows on the established road network has been found to be insignificant.

8.6.2 The impact of activity noise from the proposed development, including spectators and players, is below the current background noise levels at Coaley Road and only slightly above background at Staddon Way and Chestnut Terrace. Given the magnitude of the impact, activity noise from the proposed development is therefore considered to be insignificant at these locations.

8.6.3 The noise assessment therefore provides assurance to the nearby residents that the proposed development can take place with an insignificant impact from noise at the identified noise sensitive properties.