

Miller Goodall
Environmental Services

NOISE ASSESSMENT

on behalf of

EUXTON PARISH COUNCIL

for the site at

LAND OFF PEAR TREE LANE, EUXTON

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Summary

Noise measurements have been taken at Land off Pear Tree Lane, Euxton in order to assess the background and ambient noise levels with regards to the proposed change of use of farmland to 7 sports pitches, a changing pavilion, 90 space car park and a new access.

A noise assessment has been undertaken which shows that the noise levels, if effectively managed, can be controlled so as not to create a noise impact on local residents.

Prepared By Joanne Miller

Signed



Date

1st June 2011

Reviewed By Simon Faircloth

Signed



Date

1st June 2011

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1 Introduction

Miller Goodall Environmental Services has, on behalf of Euxton Parish Council of 9 Ambleside Avenue, Euxton, Chorley, PR7 6NX, undertaken a noise assessment with regards to the impact of the proposal to locate six playing pitches, one all weather pitch, a changing pavilion, car park and means of access on land off Pear Tree Lane, Euxton, planning reference number 11/0053/FULMAJ. The proposed playing fields are for the specific use of registered local clubs, not the general public and the hours of use would be weekends and week day evenings during daylight hours only. In particular this report addresses the potential noise impact on local residents at Pear Tree Lane and Whinney Lane. The report aims to address the concerns of the local Environmental Health Officer of Chorley Borough Council.

Discussions between Lesley Miller of Chorley Borough Council's Environmental Health Department and Steve Maslivec of Miller Goodall Environmental Services have taken place to approve the methodology for the assessment.

The methodology, findings and conclusions of this assessment are presented below.

2 Methodology

2.1 Planning Policy Guidance 24; Planning and Noise (PPG24)

PPG24 is the current government advice to Local Planning Authorities concerning noise; the planning policy guidance notes states:

'The impact of noise from sport, recreation and entertainment will depend to a large extent on frequency of use and the design of facilities'

The guidance goes on to state that the local authority will need to take into account how frequently the noise will be generated and how disturbing it will be. The aim is to balance the enjoyment of the participants against the nuisance caused to other people. The guidance also makes reference to Planning Policy Guidance PPG17; Sport and Recreation which will be discussed below.

2.2 Planning Policy Guidance PPG17; Sport and Recreation'

This policy addresses the planning issues in relation to the use of open spaces, recreation and sporting facilities. In determining where to site sports and recreational uses, among other principles, the local authority shall avoid any significant loss of amenity to residents and neighbouring uses. This policy does not provide any specific noise levels which would determine 'significant loss of amenity'.

2.3 BS 8233:1999 Sound insulation and noise reduction for buildings

This British Standard gives guidance on acceptable internal noise levels in habitable rooms within residential premises during night-time and daytime periods. This standard provides useful noise levels to assess the likelihood of significant noise, although it is worth noting that this standard relates to anonymous noise and

may not be overly relevant to this site. These are however useful indicators for the assessment. The values shown in Table 1 are given for good and reasonable conditions in habitable rooms within dwellings.

Table 1: Sound Levels in habitable rooms

Room	Criteria	Reasonable ($L_{Aeq,T}$)	Good ($L_{Aeq,T}$)
Bedrooms	Sleeping	35	30
Living Rooms	Resting	40	30

With regard to the time period to be used for the assessments BS.8233:1999 states at 7.3 "Unless otherwise stated, the noise should be assumed to be steady, such as that due to road traffic... The time period T should be appropriate for the activity involved (e.g. 23.00-07.00 for bedrooms)." Therefore the time periods for the noise limits are based on 8 hours for nighttime (bedrooms) and 16 hours for daytime (living rooms).

The standard also recommends that no individual noise event should normally exceed 45 dB L_{Amax} with a 'fast' time weighting within a bedroom for the night-time period, which is after 23:00 and therefore not relevant in this case.

There is a general understanding that a partially open window results in a noise level reduction of around 15 dB between inside and outside, the proposed external noise limits as a result of sporting activities are therefore required to be between 45 and 55 dB $L_{Aeq,T}$.

2.4 World Health Organisation.

The World Health Organisation's (WHO) document 'Guidelines for Community Noise' proposes guideline values for noise both inside and outside dwellings. These are to achieve acceptable internal noise levels to avoid annoyance. Inside dwellings, the noise level should not exceed 35 dB L_{Aeq} during the day. In relation to residential gardens, WHO advises "General outdoor noise levels of less than 55 dB L_{Aeq} are desirable to prevent any significant community annoyance". Miller Goodall is not aware of any specific noise criteria provided by Chorley Borough Council.

2.5 Planning and Design for Outdoor Sport and Play – Fit Fields in Trust (2008)

This document states that the design of any outdoor sports facilities shall be located such that:

'Facilities should be sited so that they minimize any potential nuisance'

This is a vague term, which could be referenced to Statutory Nuisance Provisions within Part III of the Environmental Protection Act 1990. With regard to the term "nuisance" there is no specific definition in the act so the tests as at common law apply. A definition often used in Court is: "A nuisance is a material interference with a person's use or enjoyment of their land or property" As part of deciding whether there has been an unreasonable interference with the use and enjoyment of nearby premises, it would be good practice to refer to relevant assessment methodologies or standards. In the absence of any well-accepted standards that quantitatively rate a given noise, establishing the existence of a nuisance will have to be a matter of judgment, taking into account factors such as the following:-

-
- a. The loudness of the noise
 - b. The duration of the disturbance
 - c. The times of day at which the noise occurs
 - d. The character of the noise
 - e. The number of days on which the noise occurs.

3 Site description

The location of the site is shown in Figure 1. The site is currently greenbelt land, which is open space surrounded by shrubs and bushes.

Figure 1 : Existing site layout and surrounding residential properties



The proposed pitches are shown in Figure 2, along with the location of the closest residential properties. There are 8 properties surrounding the site, 3 of which are on the Pear Tree Lane/School Lane junction. The nearest gardens to the proposed pitches are approximately 8 m to the touchline on the north east and approximately 22 m to the west.

To the north of the site, approximately 160 m away is Euxton Lane, a relatively busy A road. To the south lies Euxton village centre approximately 1 km away.

Assuming all 7 pitches (including the astroturf) are used simultaneously, the proposed pitches could accommodate 148 players on the basis of 20 players per mini-soccer pitch, 26 players per junior pitch and 28

players on a full size pitch, plus coaches and supporters. This would be the worst case scenario for this development.

The pitches will be provided for registered clubs only and not the general public. The proposed hours of use are weekday evening uses and weekend uses, daylight hours only. This assessment has based the hours of use on:

Monday to Friday 1600 to 2130

Saturday, Sunday and Bank Holiday 0900 to 1700

These hours of use are not likely to be continuous through these periods and during the winter periods the training/matches will stop when it is dark, at approximately 1700. During the summer months football training does not occur as frequently if at all.

Figure 2: Proposed site plan.



4 Noise Surveys

4.1 Measurement Procedure

4.1.1 Equipment

Noise measurements were undertaken in accordance with BS 7445;1991¹. The test equipment used was calibrated before and after measurements, with negligible deviation (<0.05dB). Details of the equipment used are shown in Table 2 below.

¹ BS 7445;1991 Part 1 Description and Measurement of Environmental Noise

Table 2**Noise monitoring equipment**

Equipment Description	Type Number	Manufacturer	Serial No:	Date calibrated	Calibration Certification Number
Class 1 Integrating Real Time 1/3 Octave Sound Analyzer	Type 2260	Brüel & Kjær	2467009	10.08.09	C0906736
Calibrator	Type 4231	Brüel & Kjær	2478249	10.08.09	C0906732
Microphone	Type 4189	Brüel & Kjær	2508884	10.08.09	C0906736

4.1.2 Date of monitoring and weather conditions

Existing background noise data was gathered around the site at the closest residential properties with the aim of ascertaining the existing noise climate. Measurements were taken both at the weekend and during the weekday evening to ascertain the noise level during the representative hours of use of the site. Table 3 provides the specific times and locations of the noise monitoring. Due to the timescale for the noise survey and the generally poor weather conditions, only 1 background noise survey was possible, however it is felt that these noise levels are representative of ambient daytime noise levels for the site.

Table 3**Dates, times and weather conditions during noise measurements**

Location of monitoring	Date	Time Started	Time Finished	Weather conditions
Whinney Lane	19/5/2011	20:12	20:32	Overcast, windspeed $\leq 1\text{ms}^{-1}$, dry
Pear Tree Lane	19/5/2011	20:36	20:56	Overcast, windspeed $\leq 1\text{ms}^{-1}$, dry

4.1.3 Personnel

The measurements at the site were taken by Joanne Miller.

4.1.4 Details of noise sources and measurement positions at Whinney Lane

The ambient and background noise survey comprised monitoring at 1 No. monitoring position as follows:

- The monitoring position was 1.2 m high at the north east corner of the site closest to the residential property on Whinney Lane, in order to gain a representative background noise level. Monitoring location 2 is shown in figure 1.

During the monitoring period the noise sources on site and within its vicinity were identified as follows:

- Distant road traffic noise from Euxton Lane;
- Birdsong

- Occasional passing traffic on Whinney Lane.

4.1.5 Details of noise sources and measurement positions at Pear Tree Lane

The ambient and background noise survey comprised monitoring at 1 No. monitoring position as follows:

- The monitoring position was 1.2 m high at the northwest corner of the site closest to the residential property on Pear Tree Lane, in order to gain a representative background noise level. Monitoring location 1 is shown in figure 1. This site was considered representative for both properties on Pear Tree Lane.

During the monitoring period the noise sources on site and within its vicinity were identified as follows:

- Distant road traffic noise from Euxton Lane;
- Birdsong;
- Occasional passing traffic on Pear Tree Lane.

5 Monitoring Results

5.1 Ambient and Background Noise at Whinney Lane and Pear Tree Lane

A summary of the noise readings is given in Table 4 below. Time/level plots are shown in Appendix 2 and full monitoring data can be provided upon request.

Table 4 : Summary of noise measurements at Whinney Lane and Pear Tree Lane

Position	Date and start time	T _(hours:mins)	Average ambient noise L _{Aeq,T} (dB)	Range of L _{AF,max} (dB)
1	19/5/11 20:12	25 mins	48	44 - 71
2	19/5/11 20:36	25 mins	53	55 - 73

5.2 Measured Activity Noise

Noise measurements were taken with the agreement of a local football academy. Measurements were taken at 2 locations during matches between 5 teams. Appendix A1 shows a plan of the site and the location of the monitoring. Noise samples were taken whilst a number of matches were being undertaken, including; under 10's, Under 14's, Under 16's and Under 18's. All matches were well supported, with approximately 30 supporters at each match. It has therefore been concluded that this data would be typical of the levels of noise associated with the proposed planning application. The measurements were taken on Thursday 19th May. Details of the measurements are provided in Table 5 and the overall results are provided in Appendix A1.

Details of measurement positions are provided in Appendix 2 and summarized below:

- P1 Approximately 10m from the edge of the goal line of the under 10's match and approximately 10m from the closest supporters.
- P2 Approximately 10m from the edge of the sideline of the under 14's match and approximately 30m from the closest supporters.

Table 5: Summary of noise measurements at football pitches

Measurement Location	Date	Time Started	Elapsed Time (hr:min:sec)	$L_{Aeq,T(5mins)}$ (dB)	L_{AFmax} (dB)	L_{AFmin} (dB)
P1	19/05/2011	19:19:52	0: 05:00	60.3	79.6	46
P1	19/05/2011	19:24:53	0: 05:00	60.0	79.0	46
P1	19/05/2011	19:29:54	0: 05:00	59.6	78.8	46
P1	19/05/2011	19:34:55	0: 05:00	63.2	85.6	46
P2	19/05/2011	19:42:05	0:05:00	57.2	75	45
P2	19/05/2011	19:42:05	0:05:00	56.0	66	47

The noises associated with the measured results include:

- Noise from the pitch, including; whistles and shouting
- Noise from the supporters, including; clapping, shouting and cheering.

The subjective assessment of the level of noise from the football pitches was that the noise was far less than expected and was only evident when relatively close to the pitch.

6 Impact on Local Residents

In order to assess the impact on local residents the measured levels of noise were used from measured football matches, using both the L_{Aeq} and the L_{Amax} values. It is expected that noise from vehicles using the proposed car parking facilities is unlikely to have a significant impact on nearby dwellings and is not included in our detailed assessment. Noise would typically be generated by slow moving vehicles and car doors being closed. It is expected that noise from the proposed car park will be infrequent and low level. The closest property from the car park is some 70 m away providing a reduction due to distance of around 37 dB. I would therefore not assess the car park noise to be a significant noise issue.

6.1 Ambient Noise Levels

When comparing the predicted L_{Aeq} with the existing ambient noise level at the site, the results are provided in Table 6. The measured noise levels from the football matches ranged from 56 to 63 dB $L_{Aeq(5mins)}$. These levels were taken in the middle of a number of football pitches and are thought to be relevant to the centre of the site, however not necessarily to the boundary of the site, where the housing exists.

Therefore in order to predict the level of noise to the boundary of the site a model was created and validated against the measured values for the football noise. This model was then used to assess the noise level at the closest residential property on Whinney Lane. This property is considered to be the worst-case scenario and therefore the future assessment is based on this property.

Noise predictions have been based on 2 scenarios; firstly with spectators in the middle of the field away from residential properties and secondly at the edge of the field close to residential properties. Appendix 3 shows the plan of the two scenarios used.

Table 6: Predicted L_{Aeq} Noise Levels from Proposed Development

Location	Distance from Property to the Closest Pitch (m)	Predicted Football noise level $L_{Aeq(5min)}$	Existing Ambient Noise level $L_{Aeq(5min)}$
Whinney Lane – scenario 1	19	56	48
Whinney Lane – scenario 2	19	62	48

It can be seen that the predicted L_{Aeq} values to the closest residential property are marginally above the 55dB $L_{Aeq(5min)}$ recommended within the WHO standard for gardens using scenario 1. An external value of 56 dB equates to an internal level at the closest property of 32 dB, taking into account the angle of view and shielding effect of intervening buildings and reduction due to the open window.

For scenario 2 however which is where the spectators are closest to the residential properties the levels are 6 dB higher than the former scenario and considered to be unacceptable.

6.2 Maximum Noise Levels

The events of noise which emanate from typical activities on sports pitches would include; shouting and whistles blowing. These events can be categorised using L_{Amax} noise levels and Table 7 shows the comparison between the predicted maximum noise levels and the existing maximum noise levels in the vicinity of the site.

Table 7: Predicted Maximum noise levels

Location	Predicted Football Noise Level $L_{A_{Max}}$	Existing range of maximum noise levels
Whinney Lane – scenario 1	76	44 - 71
Whinney Lane – scenario 2	82	44 - 71

The maximum noise levels are not specifically relevant against any standards for noise, since these generally assess maximum noise levels at night, for sleep disturbance purposes. However, for this assessment they are helpful in providing an insight into the levels of individual noise events which may disturb local residents. In this case the main noise source was from whistles blowing. These will be short bursts of noise during the match, for a fraction of a second possibly 40 – 50 bursts during a match.

Again the predicted levels are higher for the 2nd scenario, where the spectator noise has impacted on the $L_{A_{max}}$ noise levels. The predicted levels are higher than the existing maximum noise levels, however are not in excess of suggested maximum levels within PPG 24 of 82dB for night-time noise. The bursts of noise are of short duration and only within the duration of the match.

6.3 Summary of Impact

The predicted noise levels, particularly in relation to scenario 2 show the noise levels to be higher than the standards recommend, however for scenario 1, having the spectators located away from residential properties does reduce the impact and bring it close to guidance values.

The significant issue for this noise assessment is the periods of time when this facility is proposed to be used. It is not proposed to use the facility for the general public, only organised groups. The length of time when matches and training will take place will be limited to weekday evenings and Saturdays and Sundays between 0900 and 1700, however is unlikely to be fully occupied throughout this period.

There are no floodlights proposed on this site and therefore the evening activities will only be undertaken during daylight hours. The football season runs mid August to mid May, with training for the new season starting at the end of July.

7 Potential Mitigation Measures

As discussed within the assessment, if the site is not effectively managed there is the potential for noise disturbance to local residents. This assessment has therefore proposed mitigation measures which would include:

- Limiting the area where spectators are allowed to stand and support their teams. Figure 3 identifies the preferred location for spectators (shaded in dark blue). This would ensure that there is sufficient distance between the local residents and the spectators.

Figure 3: Plan showing shaded blue areas for spectators



- Limit the playing of football on the 2 pitches to the North East and South West when other pitches are available, this would limit the time when activities are occurring closest to residential properties.

8 Conclusions

The assessment has been undertaken of the potential for noise disturbance of the proposed football pitches at Pear Tree Lane, Euxton. The assessment has been based on a worst-case scenario using measured football noise data. The assessment has shown that when adequate controls are put into place, the proposal can operate within the requirements of various noise standards.

Mitigation measures have been proposed to ensure that the operation of the football pitches does not create a noise disturbance to local residents.

Glossary of Terms

Decibel (dB) The unit used to quantify sound pressure levels; it is derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 μPa , the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.

dB(A) Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB (A) broadly agree with people's assessment of loudness. A change of 3 dB (A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 meter; heavy road traffic about 80 dB(A) at 10 meters; the level near a pneumatic drill about 100 dB(A).

$L_{A90,T}$ The A weighted noise level exceeded for 90% of the specified measurement period (T). In BS 4142: 1990 it is used to define background noise level.

$L_{Aeq,T}$ The equivalent continuous sound level. The sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.

L_{Amax} The highest A weighted noise level recorded during the time period. It is usually used to describe the highest noise level that occurred during the event.

R_w Single number rating used to describe the sound insulation of building elements. It is defined in BS 717-1: 1997.

$R_w + C_{tr}$ Single number rating used to describe the sound insulation of building elements plus a spectrum adaptation term value to take account of the characteristics of particular sound spectra. In this case C_{tr} is a weighting that is defined in Annex A of BS 717-1: 1997 and approximates a road traffic noise sound spectra.

Appendix 1 – Noise Monitoring Time History Plots

A1.1 Background noise at Whinney Lane

Instrument: 2260
BZ7210 version
Application: 2.2
Start Time: 19/05/2011
20:12:12
End Time: 19/05/2011
20:32:17
Elapsed Time: 0:20:05
Bandwidth: 1/3 Octave
Peaks Over: 140.0 dB
Range: 20.6-100.6 dB

	Time	Frequency
Broad-band measurements:	S F I	A C
Broad-band statistics:	F	A
	Logging	
Log Rate:	0:05:01	
Broadband Parameters:	All	
Spectrum Parameters:	All	

Instrument Serial Number: 2467009
Microphone Serial Number: 2508884
Input: Microphone
Windscreen Correction: None
S. I. Correction: Frontal

Calibration Time: 19/05/2011
18:57:20
Calibration Level: 94.0 dB
Sensitivity: -26.5 dB
ZF0023: Not used

Start date	Start time	LAeq	LAFmax	LAF90
19/05/2011	20:12:12	45.3	58.4	40.0
19/05/2011	20:17:13	46.1	56.1	39.7
19/05/2011	20:22:14	51.3	69.6	41.0
19/05/2011	20:27:15	49.0	71.1	39.6
19/05/2011	20:32:16	42.1	44.8	39.1
Lowest L90				39.1
Average LAeq		48.0		
Highest Lamax			71	

A1.2 Background noise at Pear Tree Lane

Instrument: 2260
Application: BZ7210 version 2.2
Start Time: 19/05/2011 20:36:00
End Time: 19/05/2011 20:56:08
Elapsed Time: 0:20:08
Bandwidth: 1/3 Octave
Peaks Over: 140.0 dB
Range: 20.6-100.6 dB

	Time	Frequency
Broad-band measurements:	S F I	A C
Broad-band statistics:	F	A
	Logging	
Log Rate:	0:05:01	
Broadband Parameters:	All	
Spectrum Parameters:	All	

Instrument Serial Number: 2467009
Microphone Serial Number: 2508884
Input: Microphone
Windscreen Correction: None
S. I. Correction: Frontal

Calibration Time: 19/05/2011 18:57:20
Calibration Level: 94.0 dB
Sensitivity: -26.5 dB
ZF0023: Not used

Start date	Start time	L _{Aeq}	L _{AFmax}	L _{AF90}
19/05/2011	20:36:00	51.0	66.4	39.2
19/05/2011	20:41:01	56.2	72.9	42.1
19/05/2011	20:46:02	48.9	61.8	39.2
19/05/2011	20:51:03	53.1	69.9	42.3
19/05/2011	20:56:04	49.0	54.8	45.1

Lowest L₉₀ 39.2
Average L_{aeq} 53.0
Highest L_{amax} 73

A1.3 Football noise Under 10's

Instrument: 2260
 BZ7210 version
 Application: 2.2
 Start Time: 19/05/2011
 19:19:52
 End Time: 19/05/2011
 19:39:56
 Elapsed Time: 0:20:04
 Bandwidth: 1/3 Octave
 Peaks Over: 140.0 dB
 Range: 30.6-110.6 dB

	Time	Frequency
Broad-band measurements:	S F I	A C
Broad-band statistics:	F	A
	Logging	
Log Rate:	0:05:01	
Broadband Parameters:	All	
Spectrum Parameters:	All	

Instrument Serial Number: 2467009
 Microphone Serial Number: 2508884
 Input: Microphone
 Windscreen Correction: None
 S. I. Correction: Frontal

Calibration Time: 19/05/2011
 18:57:20
 Calibration Level: 94.0 dB
 Sensitivity: -26.5 dB
 ZF0023: Not used

Start date	Start time	LAeq	LAFmax	LAF90	LAFmin
19/05/2011	19:19:52	60.3	79.6	50.3	46.34
19/05/2011	19:24:53	60.0	79.0	49.6	46.38
19/05/2011	19:29:54	59.6	78.8	50.5	46.07
19/05/2011	19:34:55	63.2	85.6	50.5	46.06
Average Laeq(5mins)		61.4			
Highest Lmax			85.6		
Lowest LAFmin					46

A1.4 Football noise Under 14's

Instrument: 2260
Application: BZ7210 version 2.2
Start Time: 19/05/2011 19:42:05
End Time: 19/05/2011 19:47:37
Elapsed Time: 0:05:32
Bandwidth: 1/3 Octave
Peaks Over: 140.0 dB
Range: 30.6-110.6 dB

	Time	Frequency
Broad-band measurements:	S F I	A C
Broad-band statistics:	F	A
	Logging	
Log Rate:	0:05:01	
Broadband Parameters:	All	
Spectrum Parameters:	All	

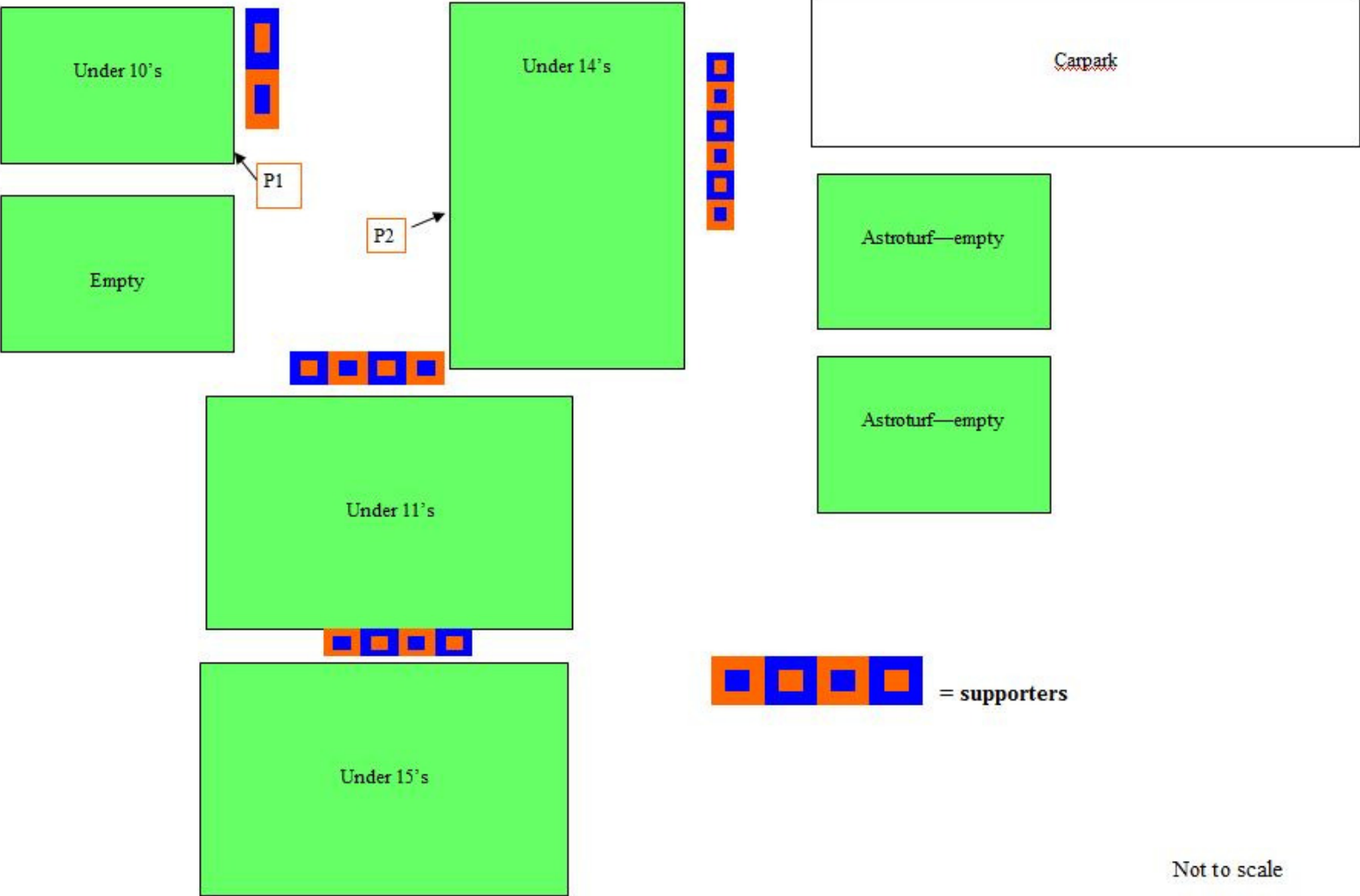
Instrument Serial Number: 2467009
Microphone Serial Number: 2508884
Input: Microphone
Windscreen Correction: None
S. I. Correction: Frontal

Calibration Time: 19/05/2011 18:57:20
Calibration Level: 94.0 dB
Sensitivity: -26.5 dB
ZF0023: Not used

Start date	Start time	L _{Aeq}	L _{AFmax}	L _{AF90}	L _{AFmin}
19/05/2011	19:42:05	57.2	75.2	48.0	44.89
19/05/2011	19:47:06	56.0	66.1	49.8	47.29
Average L _{Aeq} (5mins)		56.6			
Highest L _{max}			75		
Lowest L _{AFmin}					45

Appendix 2 – Site plan of football noise assessment

Layout and monitoring positions of football noise monitoring



Appendix 3: Plan showing assessment methodology



Not to scale