



Land to the North East of KGV Playing Fields, Cuffley

Noise Assessment
June 2015

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Lands Improvement

**Proposed Residential Development
Land to the north east of King George V Playing Field,
Cuffley**

Noise Assessment



Lands Improvement

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APPENDIX A – Ground Noise Mapping

Executive Summary

The proposed development on land to the north east of King George V Playing Field, Cuffley, will be affected by the existing noise environment. This Noise Assessment will therefore assess the suitability of the Site and the proposed development in line with current noise standards as identified through discussion with Welwyn Hatfield Borough Council.

The dominant noise sources affecting the Site are traffic from the B156 Northaw Road East and the railway, which has been confirmed through noise monitoring. The predictions of the likely future noise environment have been based on future traffic flows included in the Transport Assessment.

Using the standard UK method for the Calculation of Road Traffic Noise (CRTN), it has been found that the long term effect due to the noise of the traffic generated by this proposed development on the surrounding area will be negligible.

Noise will be created during construction of the Site, however this effect is short term and can be mitigated by measures which should be detailed in the Construction Environmental Management Plan (CEMP). This should be provided closer to the construction stage when construction activities are known. Suggested mitigation measures have been included in this report, for example confining construction activities to times of day when they would be least disturbing and use of tools that meet national noise and vibration standards.

The noise modelling software SoundPLAN has been used to assess the long term noise environment of the Site. Although PPG24 has been withdrawn, the Noise Exposure Categories (NECs) for residential development indicated within PPG24 are still considered generally relevant and are still referred to by the R19 Welwyn Hatfield District Plan 2005. This report has therefore applied the NEC thresholds as defined in PPG24 and found that the daytime and night time NEC contours indicate that the Site falls predominantly into NEC A, with the eastern boundary and varying amounts of the western boundary of the Site in NEC B. These are acceptable thresholds for residential development. It has also been found that for dwellings fronting Northaw Road East and the railway, mitigation measures such as standard thermal double glazing, trickle vents and orienting sensitive rooms away from noise sources should be sufficient to give internal noise environments below the 'desirable' level as defined in BS8233:2014.

Overall, based on this assessment and the above mitigation measures, noise does not pose a constraint to the development of this Site.

1 Introduction

- 1.1 Brookbanks Consulting Limited (BCL) is commissioned by Lands Improvement to undertake a noise assessment of a proposed development at land to the north east of King George V Playing Field, Cuffley.

Description of the Site

- 1.2 The Site is located to the south of Cuffley, is 4.89ha in size and is currently in agricultural use. It is bound by existing residential development to the north and north-west; the grounds of Cuffley Primary School also adjoin the Site along its northern boundary. The railway line and Northaw Road East (B156) form strong eastern and western boundaries respectively. The southern boundary is defined by a mature hedgerow and tree belt lining the Hertfordshire Way footpath. Beyond the footpath to the south west of the Site is King George V Playing Field, which contains three sports pavilions, a recreation area with hard surfaced Multi Use Games Areas (MUGA), sports pitches and a small area of formal play equipment.
- 1.3 The Site also includes a 0.63ha rectangular parcel of land, in agricultural use, which is located to the south west of King George V Playing Field. Northaw Road East forms the western boundary of the land, beyond which lies a small number of residential properties and buildings associated with agricultural use. Further agricultural land lies to the south whilst tennis courts, sports pavilions and a bowling green are located to the north east and south east of the Site.
- 1.4 The Site is currently undeveloped and the land is not thought to have been historically subject to any significant built development. The Site location and boundary is shown indicatively on Figure 1.1, below.

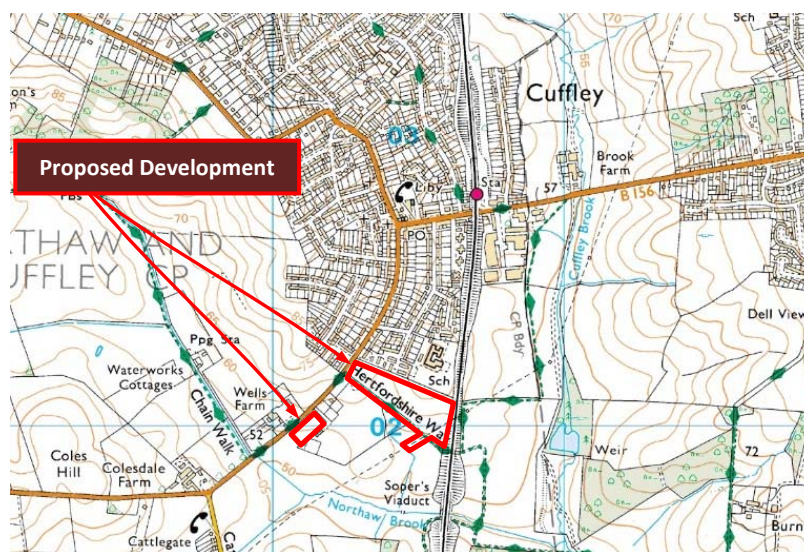


Figure 1.1: Site location

Description of the Development

- 1.5 The proposed development is to comprise: *“Residential development of up to 121 dwellings, associated infrastructure and a change in use from agricultural land to an extension of the King George V playing fields. All matters reserved except for new vehicular access to serve the site, the provision of surface water discharge points and the levels of the development platforms.”*

Purpose of This Assessment

- 1.6 This assessment’s main purpose is to identify whether noise levels across the Site pose a constraint to residential development and assess potential construction related noise impacts. Noise terminology and national guidance on noise sources relating to the assessment has been presented in section 2. Section 3 is the main body of the report and assesses the findings and the mitigation recommendations as a result of the impacts of noise on the proposed residential development. Conclusions are summarised in Section 4.

- 1.7 This report is considered as technical and contains terminology relating to noise and acoustics. A brief introduction to noise can be found in section 2.

2 Noise Assessment Criteria

Noise Terminology

- 2.1 The scale used to identify noise sources is the decibel (dB) scale which extends from 0 to 140 decibels (dB) corresponding to the intensity of the sound pressure level. The ear recognises sound based on pitch and frequencies. Microphones cannot record noise in the same way, to counter this the noise-measuring instrument applies a correction to correspond more closely to the frequency response of the ear. The correction factor is called "A Weighting" and the resulting measurements are written as dB(A). Typical dB(A) noise levels for familiar noise are indicated Table 2.1 below.

2.2

Approx. Noise Level	Noise Example
10 dB	Normal breathing
20 dB	Rustling leaves, mosquito
30 dB	Whisper
40 dB	Stream, refrigerator humming
50 dB	Quiet office
60 dB	Normal conversation
70 dB	In car noise without radio
80 dB	Vacuum cleaner / washing machine
90 dB	Lawnmower
100 dB	Train
110 dB	Pneumatic Drill
120 dB	Thunder
130 dB	Plane taking off
140 dB	Threshold of pain

Figure 2.1: Familiar Noise Levels

- 2.3 The noise levels indicated above are sound pressure levels (SPL) and describe the noise level at a single point in space. Noise levels at a receptor vary over time depending on the occurring noise generating activities. The following indices are used to take account noise level variation over time.

- $L_{Aeq T}$ is the equivalent continuous sound level and is the sound level over the time period (T). It is possible to consider this level as the ambient noise encompassing all noise at a given time. $L_{Aeq T}$ is considered the best general purpose index for environmental noise.
- $L_{A90 T}$ represents the noise level exceeded for 90 percent of the measurement period and is used to indicate quieter times during the measurement period. It is usually referred to as the background noise level.
- $L_{A10 T}$ refers to the level exceeded for 10% of the measurement period. $L_{A10 T}$ is widely used as a descriptor of traffic noise.
- L_{Amax} is maximum recorded noise level during the measurement period.

British Standard 8233:2014 Sound Insulation and Noise Reduction for Buildings

- 2.4 Environmental Health Officers at Welwyn Hatfield Borough Council have agreed that the internal noise exposure limits as set out in BS8233 and an outdoor amenity area limit of 55dB should be used for the purposes of this assessment.
- 2.5 BS8233 (Ref. 2.1) gives recommendations for the control of noise in and around buildings and suggests appropriate criteria and internal noise limits for habitable rooms of residential dwellings. In accordance with the requirements of BS8233, the following internal and daytime noise limits are desirable for sensitive rooms of the residential dwellings:
- 35dB L_{Aeq} (16 hour) during the daytime in living rooms
 - 30dB L_{Aeq} (8 hour) during the night time in bedroom areas
 - 55dB L_{Aeq} for external areas

National Planning Policy

- 2.6 PPPG 24 (Ref 1.1) was introduced by the Department of the Environment in 1994. PPG 24 provides advice on how the planning system can be used to minimise the adverse impact of noise without placing unnecessary restrictions on development or unduly adding to the costs and administrative burdens of business. PPG 24 contains advice to local authorities regarding the use of their planning powers to minimise the adverse impacts of noise when considering planning applications for new residential developments.
- 2.7 The Department of Communities and Local Government published the National Planning Policy Framework (NPPF) in March 2012. This was produced to support the reforms of the planning system and to promote sustainable growth. The NPPF document withdrew the PPG24 document.
- 2.8 However, the Noise Exposure Categories (NECs) for residential development indicated within PPG24 are still considered generally relevant.
- 2.9 PPG 24 recommends appropriate levels for exposure to different noise sources, as indicated below:

NEC	Road Traffic Noise Sources		Planning Advice
	Daytime (07.00 – 23.00) $L_{Aeq, 16hr}$ dB	Night Time (23.00 – 07.00) $L_{Aeq, 8hr}$ dB	
A	<55	<45	Noise need not be considered as a determining factor in granting planning permission, although noise at the high end of the category should not be regarded as a desirable level.
B	55-63	45-57	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise.
C	63-72	57-66	Planning permission should not normally be granted. Where it is considered that permission should be given, for example because there are no quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.
D	>72	>66	Planning permission should normally be refused.

Figure 2.2: PPG24 NEC categories

Local Planning Policy

- 2.10 This report will consider the Local Plan Policy R19: Noise and Vibration Pollution, of the Welwyn Hatfield Borough Council saved policies of District Plan 2005. It states the following measures should be considered:

“Proposals will be refused if the development is likely:

- (i) To generate unacceptable noise or vibration from other land uses; or*
- (ii) To be affected by unacceptable noise or vibration from other land uses.*

Planning permission will be granted where appropriate conditions may be imposed to ensure either:

- (iii) An adequate level of protection against noise or vibration; or*
- (iv) That the level of noise emitted can be controlled. Proposals should be in accordance with the Supplementary Design Guidance.*

Calculation of Road Traffic Noise

- 2.11 The Calculation of Road Traffic Noise (CRTN Ref 3.1) is the standard UK procedure for defining measurement and calculation methods for assessing road traffic noise. The procedures assume typical traffic and noise propagation conditions which are consistent with moderately adverse wind speeds and direction during the specified periods.
- 2.12 All predicted noise levels are expressed in terms of L_{A10} (1-hour) or L_{A10} (18-hour) between 06:00 and 24:00. The L_{A10} (18-hour) is the arithmetic average of the values of L_{A10} hourly data for each of the eighteen 1-hour periods between 06:00 and 24:00.
- 2.13 Methods of assessment have been employed that are consistent with current guidance and recommendations in the form statutory documents and recognised publications to ensure that the findings represent a robust approach to the Assessment.
- 2.14 The DMRB Volume 11, Section 3, Part 7: Environmental Assessment Procedure is used for the assessment of operational noise impacts for road schemes and gives guidance on the magnitude of impact from noise changes upon the local environment. The significance of predicted increases in road traffic noise as a result of the proposed development has been assessed according to the criteria described below.
- 2.15 Figures 2.3 and 2.4 below outline the criteria for determining the magnitude of the identified impacts.

Magnitude	Change in traffic Noise (dB)
Large	5 +
Moderate	3 – 4.9
Small	1 – 2.9
Negligible	0.1 – 0.9

Figure 2.3: Magnitude of effect - Short Term

Magnitude	Change in traffic Noise (dB)
Major	10 +
Moderate	5 – 9.9
Minor	3 – 4.9
Negligible	0.1 – 2.9

Figure 2.4: Magnitude of effect - Long Term

Calculation of Rail Noise

- 2.16 The Calculation of Rail Noise¹ document provides the method of calculating railway traffic noise levels for new and altered railways. The document is referred to as the method of assessment to be used in the Noise Insulation Regulations. This guidance can also be used for carrying out railway noise assessments for planning purposes.
- 2.17 The calculation takes into account noise generation from rail traffic sources such as rail/wheel interface and diesel power sources. The screening effects of any barriers including ground levels and buildings are assessed alongside distance attenuation. Reflection effects are also taken into account and the combined noise level at a given point is calculated for all the different train types passing the receptor.

3 Noise Assessment

Introduction

- 3.1 For the purposes of this assessment the study area has been taken as the site boundary for the PPG24 assessment. A wider study to assess the impact within the local road network has been based on the study area adopted within the Transport Assessment.

Existing Background Noise Monitoring

- 3.2 Existing noise measurements have been carried out near the Site adjacent to existing local noise sources. The results have been used to validate the 3D noise mapping produced by SoundPLAN (Appendix A).
- 3.3 Daytime and night time noise levels have been monitored over a 24 hour period. All acoustic measurement equipment used during the noise surveys conformed to Type 1 specification of British Standard 61672: 2003: Electroacoustics, Part 1 Specifications.

Equipment Description	Manufacturer	Serial Number
Sound Level Meter	Norsonic 118	28952
Sound Level Meter	Casella CEL 480	089653
Acoustic Calibrator	Norsonic 1251	32856

Figure 3.1: Noise Monitoring Equipment Inventory

- 3.4 Background noise in the area is dominated by road traffic noise from the surrounding area, with Northaw Road East being the most significant traffic source. The M25 motorway is approximately 0.8 miles south of the development and is audible at the Site location. The railway line on the eastern boundary is also a significant noise source. No other significant noise sources have been recorded. The results of the survey are indicated below together with the locations of the noise monitoring.

Location	Daytime LAeq	Daytime LMax	Night time LAeq	Night time LMax
	16hr	1hr	8hr	1hr
Location 1	52	78.8	51	77.4
Location 2	54	82.9	48	80.8

Figure 3.2: Noise Monitoring Results

¹ Department of Transport (1995) The Calculation of Rail Noise



Figure 3.3: Noise Monitoring Locations

- 3.5 The results of the noise survey indicate that the site boundary lies predominantly in NEC A with a small areas at the eastern and western boundaries of the Site lying in NEC B. The noise survey demonstrated that traffic noise is the predominant noise source. The results of the noise survey show indicate that the site boundary lies within the outdoor amenity boundary of BS8233:2014 of 55dB.

Site Suitability

- 3.6 Traffic noise predictions have been made using the CRTN prediction methodology. The methodology has been used to predict the magnitude of any change in noise level resulting from the development proposals at the roadside of the local network.
- 3.7 The predicted changes in noise level, identified with respect to the road traffic noise impact assessment criteria, are presented in Table 3.1 showing the future year with and without development.

Link	Basic Noise without development	Basic noise with development	Noise Impact	Magnitude
B156 Northaw Road	70.6	70.8	0.2	Negligible

Table 3.4: Predicted Noise levels within local road network

- 3.8 This demonstrates the maximum increase that any of the noise receptors are likely to experience is identified to be 0.2dB. All of the receptors will experience a negligible increase after the completion of the development. It is considered that an increase of less than 3dB is not discernible and therefore it is concluded that the development will have a negligible impact.

PPG24: Noise Assessment

- 3.9 Noise level prediction of the existing situation has taken place through computer modelling software SoundPLAN. The noise model incorporated a recent topographical survey that highlighted all the pertinent Site features. The assessment was based on recent traffic flows as provided by the Transport Consultant. Traffic flows were also provided for the future year assessment with and without the development site.

- 3.10 The NEC boundaries for the existing situation were modelled for the daytime and night time traffic flows initially. This indicated that the Site lies predominantly in NEC A. Along the western boundary of the site, the land lies in NEC B.
- 3.11 The NEC boundaries for the proposed development were then modelled with the resultant daytime and night time noise contours indicating that the Site still mainly falls into NEC A with the western and eastern site boundaries falling into NEC B. Properties that have a façade facing Northaw Road East and the railway are mainly predicted to fall in the NEC B boundary, with all other properties located within NEC A. Based on the indicative masterplan, there are likely to be very few properties within the NEC B boundary areas.
- 3.12 PPG24 advises that for sites that fall into NEC A:
- “Noise need not be considered as a determining factor in granting planning permission, although noise at the high end of the category should not be regarded as a desirable level.”
- 3.13 PPG24 advises that for sites that fall into NEC B:
- “Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise.”
- 3.14 Properties falling within NEC B typically require nothing more than standard thermal double glazing to provide an acceptable noise environment. Table 1 in Annex 6 of PPG24 provides examples of typical noise reductions for a dwelling façade with windows set in a brick/block wall. The table shows various levels of noise reduction provided by different glazing configurations and for different noise sources. The values shown are the level difference (in dBA) between the outside and the inside of a typical dwelling and to represent worst case, it is assumed that the outside level is a façade measurement. For a road traffic noise spectrum, PPG 24 states that standard thermal double glazing will provide a façade sound insulation performance of 33 dB(A).
- 3.15 However, opening windows for ventilation purposes would reduce the insulation provided by the building façade and may cause internal design standards to be exceeded. Therefore, if it is considered necessary to satisfy internal noise standards with a degree of ventilation, mitigation measures may be required to enable occupiers to obtain ventilation with windows closed. Passive acoustic ventilators with the appropriate attenuation can be installed within the walls of habitable rooms or utilise 'trickle' vents within the window frames only for those houses fronting onto Northaw Road East and the railway.

BS8233:2014 Assessment of Day Time Noise Levels in Living Rooms

- 3.16 BS8233 indicates that the desirable internal noise level for dwellings is 35dB LAeq. The calculated noise levels have been used to determine likely noise levels and the extent of attenuation required.
- 3.17 To determine the internal noise levels two typical housing locations, as shown on the current masterplan, fronting Northaw Road East and the railway have been selected. This indicates that the day time façade noise level 56.1dB and 55.0dB by Northaw Road East and the railway respectively. The higher noise level reduces to 22.0dB when taking into account noise reductions through thermal double glazing, which is lower than the BS8233 target noise levels. This could be reduced further with efficient orientation of rooms and the change of location during the detail design stage.
- 3.18 This indicates that appropriate attenuation can be achievable for all of the properties through the use of thermal double glazing, with facades of properties further into the Site being protected and screened by other buildings.

BS8233:2014 Assessment of Night Time Noise Levels in Bedrooms

- 3.19 BS8233 indicates that an internal night-time noise level of 30dB LAeq represents a desirable standard in bedrooms. The calculated noise levels have been used to determine likely noise levels and the extent of attenuation required.

3.20 Using the dwelling locations shown in the current masterplan, a typical night time façade noise levels is identified at Northaw Road East as 54.8dB and by the railway as 52.2dB. The higher noise level reduces to 21.8dB when taking into account noise reductions through thermal double glazing, which is in compliance to BS8233.

3.21 This indicates that appropriate attenuation will be achievable. Drawing 10316-006 (Appendix A) shows facades of properties further into the Site being protected and screened by other buildings.

BS8233:2014 Assessment of External Noise Levels in External areas

3.22 BS8233 indicates that a level of 55 dB L_{Aeq} represents a desirable standard for external areas used for amenity space. The calculated noise levels have been used to determine likely noise levels and the extent of attenuation required.

3.23 Back gardens near Northaw Road East and the railway are shown to have daytime noise levels of 42.8dB and 54.0 dB respectively. During the night time period, these reduce to 39.1dB and 51.2dB respectively. This demonstrates that an acceptable external noise environment across the Site is achieved.

3.24 The playing fields are to be used for amenity purposes and will therefore be assessed against noise levels in external areas. The noise levels at the edge of the example pitch location shown in Appendix A are predicted to be 53.5dB during the daytime and 49.3dB at night time. These show that the areas expected to be used for amenity purposes have noise levels predicted to be within the acceptable limits defined by BS8233:2014. The playing fields are also expected to benefit from screening from existing trees and hedgerows, the effect of which have not been included in the modelling.

3.25 There is no universal method of assessing the impact of areas such as the proposed playing fields. However, one method of assessment would be to assess them as a producer of point sources of shouting. Shouts are generally accepted to be about 80dB. For perspective, noise levels of 52dB were monitored as the current situation, mainly due to traffic at Northaw Road East.

3.26 The proposed playing fields are expected to be used intermittently. Due to the long term nature of the L_{Aeq} measurements it is not expected that the level of 55 dB L_{Aeq} , which needs to be met for external areas, will be exceeded due to use of the playing field. It should also be considered that there are already tennis courts and a football pitch to the north and east of the playing field site which would produce equivalent noise impacts on the surrounding area. No material changes to the local noise environment are therefore predicted due to the change of use of the agricultural land to playing fields.

Effect during construction phase: short to medium term

3.27 At present there are no details available regarding the construction programme or the construction plant to be used. Construction activities produce significantly high noise levels, particularly close to source. However construction noise tends to fluctuate and is usually of fairly short duration. The construction noise impacts will depend on the proximity of construction activities to nearby receptor locations.

3.28 Given the nature of the construction activities expected on site, the impact could be significant without mitigation. However the construction noise impacts can be mitigated against through the introduction of a Construction, Environmental Management Plan. This is discussed further in the mitigation section.

Construction Mitigation Measures

3.29 To minimise the impact on receptors during the construction process, the following generic noise mitigation measures need to be implemented as appropriate for all works and could be incorporated into a Construction Environmental Management Plan:

- Construction activities should be confined to times of the day when they are least likely to be disturbing;
- Careful selection of plant, construction methods and programming. Only a plant conforming with relevant national or international standards, directives and recommendations on noise and vibration emissions should be used;

- The construction plant should be located, as far as is reasonably practicable, away from adjacent occupied buildings or as close as possible to noise barriers or Site hoardings where these are located between the plant and the buildings;
- Static and semi-static plant/equipment (e.g. compressors and generators) should be fitted with suitable enclosures where practicable;
- Personnel will be instructed on best practice to reduce noise and vibration as part of their induction training and as required prior to specific work activities;
- When the plant is not being used, it should be shut down and not left to idle;
- Methods of work and vehicular routes will be selected with regard to minimising noise and vibration impact;
- With the phasing of construction, it is possible that certain areas of the development may be occupied while construction is still underway in adjacent areas. Where possible, the occupancy of completed phases of construction should be planned in such a way that there is a buffer between occupied areas and areas where construction is being carried out; and
- A Construction Environmental Management Plan is to be completed.

Residential Mitigation Measures

3.30 The following generic noise mitigation measures need to be implemented as appropriate:

- Standard thermal double glazing, including trickle vents, for the residential properties fronting onto Northaw Road East and the railway.
- Orientating the internal layout of the dwellings close to Northaw Road East and the railway to minimize sensitive rooms fronting onto local noise sources.

4 Conclusion

- 4.1 Ambient noise levels adjacent to and within the development Site of Land to the north east of King George V Playing Field, Cuffley, have been assessed relative to the criteria documented in BS8233:2014 and Planning Policy Guidance 24 (PPG24): Planning and Noise.
- 4.2 The daytime and night time noise NEC contours indicate that the Site falls predominantly into NEC A, with the eastern boundary and varying amounts of the western boundary of the Site in NEC B. This demonstrates that the noise levels predicted across the Site lie within the acceptable thresholds as defined in PPG24.
- 4.3 A review of the internal noise levels, both in living rooms, bedrooms and external amenity areas indicates that a desirable noise standard, as defined by BS8233, will be achieved for all the houses. Appropriate mitigation for the houses fronting Northaw Road East and the railway is standard thermal double glazing, trickle vents and orientation of sensitive rooms away from these local noise sources. All other properties are provided with noise protection by neighbouring properties. In the area where there is a proposed change in use to playing fields, desirable noise levels are expected to be achieved therefore no mitigation measures are recommended for this area.
- 4.4 Based on this assessment and the above mitigation measures, noise does not pose a constraint to the development of the Site.



5 References

- 1.1 Communities and local Government (1994) PPG24: Planning and Noise
- 2.1 British Standard 8233:2014; Sound Insulation and Noise Reduction of Buildings
- 3.1 Department of transport (1988), The Calculation of Road Traffic Noise

6 Limitations

- 6.1 The benefits of this report are provided solely to Lands Improvement Holdings Ltd. The conclusions and recommendations contained herein are limited to those given the general availability of background information and the planned usage of the site. Brookbanks Consulting Ltd do not confer any third party rights for the information contained in the report.
- 6.2 Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assume is correct at the time of writing.



Appendix A



KEY:

Levels in dB:

- 0 - 55
- 55 - 63
- 63 - 72
- Over 72

NOTES:

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LANDS IMPROVEMENT
PROPOSED DEVELOPMENT

LAND TO THE NORTH EAST
OF KING GEORGE V
PLAYING FIELDS, CUFFLEY

BASELINE
DAYTIME NOISE CONTOURS

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KEY:

Levels in dB:

- 0 - 45
- 45 - 57
- 57 - 66
- Over 66

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LANDS IMPROVEMENT
PROPOSED DEVELOPMENT

LAND TO THE NORTH EAST
OF KING GEORGE V
PLAYING FIELDS, CUFFLEY

BASELINE
NIGHT TIME NOISE CONTOURS

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KEY:

Levels in dB:

<div></div>	0 - 55
<div></div>	55 - 63
<div></div>	63 - 72
<div></div>	Over 72

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LANDS IMPROVEMENT
PROPOSED DEVELOPMENT

LAND TO THE NORTH EAST
OF KING GEORGE V
PLAYING FIELDS, CUFFLEY

2018 BASELINE
DAYTIME NOISE CONTOURS

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6150 Knights Court, Solihull Parkway, Birmingham B37 7WY
Tel (0121) 329 4330 Fax (0121) 329 4331
www.brookbanks.com

Scale at A3 NTS	Drawing No. 10316-NM-003	Rev. -
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KEY:

Levels in dB:

- 0 - 45
- 45 - 57
- 57 - 66
- Over 66

NOTES:

- 1. Do not scale from this drawing.
- 2. Brookbanks Consulting Ltd has prepared this drawing for the sole use of the client. The drawing may not be relied upon by any other party without the express agreement of the client and Brookbanks Consulting Ltd. Where any data supplied by the client or from other sources has been used, it has been assumed that the information is correct. No responsibility can be accepted by Brookbanks Consulting Ltd for inaccuracies in the data supplied by any other party. The drawing has been produced based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.
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Rev	Revision Details		Drawn	Checked	Approved	Date
PRELIMINARY					10/2014	
Issue Status			Approved		Date	
Drawn	SD	Checked	AE	Date31/10/14		

LANDS IMPROVEMENT
PROPOSED DEVELOPMENT

LAND TO THE NORTH EAST
OF KING GEORGE V
PLAYING FIELDS, CUFFLEY

2018 BASELINE
NIGHT TIME NOISE CONTOURS

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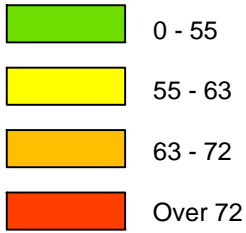
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KEY:

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Drawn	SD	Checked	AE	Date31/10/14		

LANDS IMPROVEMENT
PROPOSED DEVELOPMENT

LAND TO THE NORTH EAST
OF KING GEORGE V
PLAYING FIELDS, CUFFLEY

2018 WITH DEVELOPMENT
DAYTIME NOISE CONTOURS

© Brookbanks Consulting Limited 2014

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Scale at A3 NTS	Drawing No. 10316-NM-005	Rev. -
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**KEY:**

Levels in dB:

0 - 45

45 - 57

57 - 66

Over 66

NOTES:

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PRELIMINARY						10/2014	
Issue Status				Approved		Date	
Drawn SD		Checked AE		Date			31/10/14

LANDS IMPROVEMENT
PROPOSED DEVELOPMENT

LAND TO THE NORTH EAST
OF KING GEORGE V
PLAYING FIELDS, CUFFLEY

2018 WITH DEVELOPMENT
NIGHT TIME NOISE CONTOURS

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Scale at A3
NTS

Drawing No.
10316-NM-006

Rev.
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