MAGNA PARK
LUTTERWORTH

IDI Gazeley
Brookfield Logistics Properties

IDI Gazeley UK Ltd

# Magna Park Extension: Hybrid Application

## ES Chapter 7 Noise and Vibration

MAGNA PARK
LUTTERWORTH

IDI Gazeley
Brookfield Logistics Properties

*Page intentionally blank*

| Author/Amended by: | Authorised by | Date: | Version: |
|---|---|---|---|
| Johnny Berrill | Tom Zarebski | 23/09/2015 | First Issue |
| | | | |
| | | | |

# CONTENTS

## Contents

**List of Technical Appendices in Environmental Statement: Volume 3**

Appendix D 1: Noise Impact Assessment
Appendix D 2A: Zone 1 Noise Survey
Appendix D 2B: Zone 2 Noise Survey
Appendix D 3: Operational Assessment Basis
Appendix D 4: Traffic Assessment Locations
Appendix D 5: Construction Noise Criteria
Appendix D 7: Example Code of Construction Practice

# 7 Technical ES Chapter

## 7.1 Introduction

7.1.1 This chapter has been prepared by Cole Jarman, Consultants in Acoustics. This ES chapter considers the effect of operational activity noise, road traffic noise, and construction noise upon existing residential receivers due to the proposed industrial development at Magna Park Extension: Hybrid Application.

7.1.2 A detailed description of the site, its context and development proposals are set out in Chapter 2 of this Environmental Statement (ES).

7.1.3 This chapter should be read in conjunction with its appendices (Technical Appendices D) which include technical details of the noise survey, assessment methodology and assessment conclusions.

7.1.4 The appendices set out the base data used, graphical representations and figures relevant to the noise assessments. The assessment has made use of statutory guidance, codes of practice and general sources of information, which are referenced within this chapter and its technical appendices. Reference is made to appropriate planning policy and guidance.

## 7.2 Policy and Guidance

7.2.1 The National Planning Policy Framework (NPPF)[i] now represents the national context within which noise assessments should be conducted. Where local plans are out of date or silent on a particular topic, the NPPF takes precedence.

7.2.2 The NPPF also refers to the Noise Policy Statement for England (NPSE)[ii].

7.2.3 Taken together, the aims of the documents are broadly to ensure that sustainable development can take place in appropriate locations, while providing suitable conditions for existing and proposed residences, as well as maintaining and enhancing the environment where possible and appropriate.

7.2.4 The Planning Practice Guidance (PPG)[iii] was published on 06 March 2014. The PPG includes a section on noise which sets out considerations of the acoustic environment that should be taken into account during local planning authorities' plan-making and decision taking.

7.2.5 BS 4142:2014[iv] relates to the assessment of noise from industrial and commercial developments. This document sets out the methods of assessing such noise and establishing representative background sound levels upon which to base the noise criteria.

### National Planning Policy Framework

7.2.6 National planning policy in England is contained within the National Planning Policy Framework (NPPF) which was published in March 2012. The specific policies of the NPPF that relate to issues of noise are set out below.

7.2.7 **Paragraph 17** states that planning should contribute to conserving and enhancing the natural environment and reducing pollution, seeking to secure high quality design and a good standard of amenity for all existing and future occupants of land.

7.2.8 **Paragraph 109** states that the planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to

or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of noise pollution.

7.2.9 **Paragraph 123** states that planning policies and decisions should aim to avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development. Decisions should aim to mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions. Paragraph 123 recognises that development will often create some noise and existing businesses wanting to develop should not have unreasonable restrictions put on them.

7.2.10 **Paragraph 123** refers to the Noise Policy Statement for England, and no other particular standards.

## Noise Policy Statement for England

7.2.11 The Noise Policy Statement for England (NPSE, which pre-dates and is reflected by the NPPF) does not set quantitative guidelines for the suitability of development in an area depending on the prevailing or expected levels of noise. Absent, therefore, is reference to specific noise thresholds which determine whether noise sensitive or noise generating development is suitable and, if so, whether particular mitigation factors need to be considered. Instead, the NPSE sets out three aims as set out below.

7.2.12 The first aim of the Noise Policy Statement for England:

*"Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development."*

7.2.13 The second aim of the Noise Policy Statement for England:

*"Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development."*

7.2.14 The third aim of the Noise Policy Statement for England:

*"Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development."*

7.2.15 In essence, therefore, each development site must be judged on its ability to deliver on each of these aims, and while rating the prevailing noise against predefined thresholds is no longer necessary, defining the prevailing noise levels is an essential first step in assessing a given site under the current regime.

7.2.16 With respect to Significant Observed Adverse Effect Levels (SOAEL) etc. (please refer to the Planning Practice Guidance section below) the NPSE states:

*"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times."*

It is therefore necessary to assess each site and situation on its own merits and establish SOAELs etc which relate specifically to those circumstances.

## Planning Practice Guidance

7.2.17 In March 2014, the Government announced the launch of the Planning Practice Guidance (PPG) website. The PPG is intended to be read alongside the NPPF and we set out below the guidance that is most relevant to the consideration of noise.

7.2.18 Part ID30 of the PPG gives guidance on the relevance of noise to a planning decision. **Paragraph 003** (ID: 30-003-20140306) states that decision taking should take account of the acoustic environment and in doing so consider the degree of effect associated with the proposal.

7.2.19 **Paragraph 006** (ID: 30-006-20140306) states that various factors need to be considered when assessing the relationship between noise levels and the potential impact on those affected. **Paragraph 008** (ID: 30-008-20140306) identifies that noise can be mitigated through engineering, layout, planning conditions/obligations and finally though measures at receivers in areas likely to be affected by noise.

7.2.20 The PPG makes reference to the NPSE and states at **Paragraphs 003** and **004** (ID: 30-003-20140306 and ID: 30-004-20140306) that the aim is to identify where the overall effect of the noise exposure falls in relation to Significant Observed Adverse Effect Level (SOAEL), the Lowest Observed Adverse Effect Level (LOAEL) and the No Observed Effect Level (NOEL).

7.2.21 Under **Paragraph 005** (ID: 30-005-20140306) the guidance then presents a table, which is reproduced as table TB1 in attached Technical Appendix D.3. The implication of the final line of the table is that only the 'noticeable and very disruptive' outcomes are unacceptable and should be prevented. All other outcomes (i.e. all other lines in the table) can be acceptable, depending upon the specific circumstances and factors such as the practicalities of mitigation, although effects corresponding to the penultimate line should be avoided.

7.2.22 Under the topic of further considerations relating to mitigating the impact of noise on residential developments (**Paragraph 009**; ID: 30-009-20140306) the PPG states that the noise impact may be partially off-set if residents of affected dwellings have access to:

- a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling, and/or;
- a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced with increasing noise exposure and could be such that significant adverse effects occur, and/or;
- a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings, and/or;
- a relatively quiet, protected, external publically accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance).

7.2.23 This is not to say that access to the above items is mandatory, rather that it can help to offset any noise impacts.

## Core Strategy and Saved Local Plan Policies

7.2.24 The development plan comprises the adopted Harborough District Core Strategy (2011) and the saved policies of the Harborough District Local Plan (2001). We set out below the relevant local planning policy in respect of noise.

*Harborough District Local Plan (Saved Policies)*

7.2.25 Policy EV/23 states that, where appropriate, the Council will impose conditions on planning permission to ensure that development does not have an adverse effect on the character of its surroundings, or harm the amenities of nearby uses through noise pollution.

## Guidance Specific to Noise

7.2.26 Other guidance relating to operational noise is set out in the technical report attached in Technical Appendix D.3. The aim is to assess the predicted noise impact of the proposed development using the relevant assessment methodologies. Where necessary, recommendations would then be provided on implementing mitigation to ensure that the noise limits set out in the appendix are achieved where practicable.

7.2.27 The principle of assessing changes in ambient noise level due to the operation of the development against background ambient noise levels was originally agreed upon with the Environmental Health Officer. Since that agreement was made, a new edition of BS 4142 has been published and therefore the assessment methodology has been updated to comply with this standard as appropriate, as set out in detail in attached Technical Appendix D.3.

7.2.28 To summarise, regarding noise impact from a distribution centre, BS 4142:2014 provides an assessment methodology and criteria relating to:

a. *sound* from industrial and manufacturing processes;

*b. sound from fixed installations which comprise mechanical and electrical plant and equipment;*

*c. sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and*

*d. sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.*

7.2.29 The application of the standard is detailed below:

*"This standard is applicable to the determination of the following levels at outdoor locations:*

*a. rating levels for sources of sound of an industrial and/or commercial nature; and*

*b. ambient, background and residual sound levels*

*for the purposes of:*

*i. investigating complaints;*

*ii. assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and*

*iii. assessing sound at proposed new dwellings or premises used for residential purposes."*

7.2.30 Therefore, where onsite activity is concerned, the approach taken is in accordance with BS 4142:2014. The rating level of noise from the facility is calculated, over a set time period, at each of the nearest and most exposed noise sensitive locations (including penalties, where appropriate, to account for the character of each type of noise source). This rating level is then compared with the existing background sound level. It is also compared with absolute noise

level thresholds derived from various other sources of relevant guidance such as from the World Health Organisation (please refer to Appendix D.3 for details). Limits for operational noise are then based upon both of these comparisons as appropriate and as described in the appendix.

7.2.31 Where noise from fixed plant is concerned, the intention is to set noise limits which are 10 dB below the operational noise limit during each period in which plant operates, with a further penalty for any plant that exhibits attention attracting characteristics likely to be audible at receptors, in accordance with BS 4142:2014. This control means operational noise can be designed to the overall relevant noise limit without noise from fixed mechanical services plant (which is more readily controlled than general operational noise) increasing the noise level above the applicable limit.

7.2.32 Other guidance relating to road traffic noise is set out in attached Technical Appendix D.5. The assessment adopts the approach of comparing noise levels due to road traffic flows including traffic generated by the proposed development with the baseline traffic flows, all of which are provided by the transport consultant.

The principles of assessing the noise impact due to the operation of the proposed development have been agreed upon with the Harborough District Council Environmental Health Officer.

## 7.3 Assessment Method

### Operational Noise Activity Assessment

7.3.1 An assessment of the operational activity noise from the proposed site has been undertaken. The assessment is undertaken on the basis of a BS 4142:2014 assessment with reference to PPG. The attached Technical Appendix D.3 sets out the assessment methodology in detail. The methodology is summarised in this section.

7.3.2 A background sound survey was undertaken at the proposed site, in the vicinity of the most exposed noise sensitive receptors, as identified and agreed upon through liaison with the local authority. The survey was undertaken at various locations over three separate monitoring periods.

7.3.3 The first monitoring period relates to the noise sensitivities located most exposed to the Zone 2 detailed application site and was in October 2011. The second two monitoring periods were undertaken in September and October 2014 and relate to the Zone 1 outline application site. The noise data collected under both surveys has been approved for use as set out in Appendix D.1

7.3.4 From this survey representative background sound levels were established for each of the assessment positions in accordance with BS 4142:2014. With reference to the existing background sound levels, noise limits for the operational noise from the proposed units are set for both day and night time periods. In accordance with BS4142:2014, where existing background sound levels are low it can be appropriate to consider absolute noise level thresholds. These absolute noise level thresholds are developed and set out in Technical Appendix D.3 with reference to the Planning Practice Guidance on noise.

7.3.5 For each assessment position absolute or relative noise criteria are set depending on the existing noise climate. The relevant noise limits are then applied to the operational noise of the units on an hourly basis during daytime hours and on a 15-minute basis during night time hours.

7.3.6 An acoustic model was then created using a computer based noise prediction program (Wölfel IMMI 2014). This has been used to determine the free field noise levels, at the assessment

positions, generated by the onsite vehicular movements and loading actives at the relevant site.

7.3.7 An assessment was undertaken of the operational noise associated with the Zone 1 sites, with reference to a single two-way movement of a HGV entering the site, parking, decoupling, tug moving to the loading bay and loading/unloading, tug returning the trailer to the parking bay and the HGV then exiting the site. Where applicable a similar assessment was undertaken on car movements, based on a car entering, parking, and then exiting the site.

7.3.8 An assessment was undertaken of the operational noise associated with the Zone 2 site, with reference to a two-way (arrival and departure) shuttle movement, two-way tug and associated container movements (one per arrival and departure of tug and shuttles, four per total movement).

7.3.9 Hourly traffic movements have been predicted by AECOM and these hourly movements were then used to assess the overall impact of noise from the vehicles accessing and using the site as mentioned above. Any mitigation required to control noise levels from the site were then identified.

7.3.10 Based on the discussion set out in the attached Technical Appendix D.3, the following absolute level criterion ranges, and their corresponding required actions, have been proposed.

| BS 4142 Rating Level, dB | | Comparable PPG Effect Level | Action Required |
|---|---|---|---|
| Day | Night | | |
| $L_{Ar,Tr} < 40$ | $L_{Ar,Tr} < 30$ | No observed effect | No specific measures required |
| $L_{Ar,Tr} = 40$ | $L_{Ar,Tr} = 30$ | NOEL | No specific measures required |
| $40 < L_{Ar,Tr} < 45$ | $30 < L_{Ar,Tr} < 40$ | No observed adverse effect | No specific measures required |
| $L_{Ar,Tr} = 45$ | $L_{Ar,Tr} = 40$ | LOAEL | No specific measures required |
| $45 < L_{Ar,Tr} < 55$ | $40 < L_{Ar,Tr} < 45$ | Observed adverse effect | Mitigate and reduce to a minimum |
| $L_{Ar,Tr} = 55$ | $L_{Ar,Tr} = 45$ | SOAEL | Mitigate and reduce to a minimum |
| $55 < L_{Ar,Tr} \leq 65$ | $45 < L_{Ar,Tr} \leq 55$ | Significant observed adverse effect | Avoid |
| $L_{Ar,Tr} > 65$ | $L_{Ar,Tr} > 55$ | Unacceptable observed adverse effect | Prevent |

Table 7.1 - Proposed assessment criteria for absolute levels

7.3.11 Where the background sound level is greater than 45 dB(A) during the day and 40 dB(A) at night, it will be necessary to consider the impact of the proposals with reference to the existing background sound level and climate. In this case the following assessment basis is proposed, by correlating the impact descriptions in BS 4142 and the effect descriptions in planning policy guidance. The table sets out equivalent PPG effect levels and actions required for various relationships between the rating level of the noise source at the receptor ($L_{Ar,Tr}$) and the background sound level at a location representative of the receptor ($L_{A90,T}$).

| BS4142 Assessment | Comparable PPG Effect Level | Action Required |
|---|---|---|
| $L_{Ar,Tr} < L_{A90,T}$ | No observed effect | No specific measures required |
| $L_{Ar,Tr} = L_{A90,T}$ | NOEL | No specific measures required |
| $L_{A90,T} < L_{Ar,Tr} < L_{A90,T} + 5$ | No observed adverse effect | No specific measures required |
| $L_{Ar,Tr} = L_{A90,T} + 5$ | LOAEL | No specific measures required |
| $L_{A90,T} + 5 < L_{Ar,Tr} < L_{A90,T} + 10$ | Observed adverse effect [1] | Mitigate and reduce to a minimum [2] |
| $L_{Ar,Tr} = L_{A90,T} + 10$ | SOAEL [1] | Mitigate and reduce to a minimum [2] |
| $L_{Ar,Tr} > L_{A90,T} + 10$ | Significant observed adverse effect [1] | Avoid [2] |

Table 7.2 - Proposed BS4142 assessment criteria above absolute level limits

7.3.12 Where night time impulsive noise is concerned the Lowest Observable Adverse Effect Level (LOAEL) is considered to correspond to 57 dB $L_{Amax}$ except when existing sound levels are sufficiently high to mask events giving rise to this noise level, in which case it is appropriate to compare $L_{Amax}$ levels resulting from operations with the existing $L_{Amax}$ levels..

7.3.13 Where development noise events from sources designed specifically to attract attention (such as reversing bleepers) are concerned, night time noise levels should again not exceed 57 dB $L_{Amax}$ to ensure the LOAEL is not exceeded. However a penalty of up to 12 dB should be applied to account for the fact that reversing sounders are specifically designed to attract attention and they exhibit tonal and intermittent characteristics. This principle of adding penalties when considering $L_{Amax}$ applies to these noise sources only and not to any others.

7.3.14 The Scheduled Monument of Bittesby Deserted Medieval Village is located in close proximity to the corridor of proposed planting. The operational noise aspirational target at the scheduled ancient monument, AP5, is 55 dB $L_{Aeq,\ 1\ hour}$ and applies during daytime hours only.

## Road Traffic Noise Assessment for Existing Sensitivities

7.3.15 When assessing potential noise effects due to changes in road traffic flows as a result of a development, it is appropriate to refer to the Design Manual for Roads and Bridges (DMRB)[v] The Manual sets out noise assessment procedures to be followed when undertaking highway works such as building new roads.

7.3.16 Regarding changes in road traffic due to the proposed development, the DMRB provides useful guidance for assessing changes in road traffic noise due to variations in the flow rate and vehicle composition of the traffic.

7.3.17 DMRB sets out thresholds at which potential effects may start to become apparent, based on changes in 18-hour daytime noise levels (0600-2400h). The threshold is a change of 1 dB(A) when assessing short term effects (i.e. comparing with- and without-development flows for the year of opening of a road scheme) and 3 dB(A) when assessing long term effects (i.e. comparing with-development flows in a future year and without-development flows in the year

[1] Except where $L_{Ar,1hour} \leq 45$ during the day or $L_{Ar,15minute} \leq 40$ dB during the night, in which the effect is equivalent to LOAEL or NOEL.

[2] Except where $L_{Ar,1hour} \leq 45$ during the day or $L_{Ar,15minute} \leq 40$ dB during the night, in which case no specific measures are required for noise occurring during the relevant day or night period

of opening - the future year can normally be considered to be the year during which the greatest traffic flows will occur within 15 years of opening).

7.3.18 In general, calculations are carried out of Basic Noise Levels for the various scenarios, using the methodology set out in the Department for Transport document Calculation of Road Traffic Noise (CRTN)[vi].

7.3.19 The calculations are based on traffic flow data supplied by the transport consultant Aecom and take account of the percentage made up of Heavy Goods Vehicles and the stated speed limit for the road, or where available the actual speeds provided by the transport consultant. The resultant noise level figure is the $L_{A10,\ 18\ hour}$ (dB).

7.3.20 For developments such as that being considered in this ES, where complex or significant road traffic noise effects due to highway works are not expected, it is appropriate to undertake the assessment in terms of changes in the Basic Noise Level defined at 10m from the edge of the carriageway in CRTN. This does not relate directly to the noise exposure at individual residential façades but is a reference noise level, comparison of which in various scenarios provides a good indication of the noise level changes that are expected to occur along an existing road link where the road itself is the dominant road traffic noise source.

7.3.21 On roads where 18-hour traffic flows (0600-2400h) are lower than 1000 vehicles per day this falls outside the scope of CRTN. On roads where this is the case it is not valid or appropriate to use the same procedures to calculate resultant noise levels. It is relevant to consider any changes in noise levels in the context of absolute noise levels in these instances. However in all cases, the 18-hour traffic flows assessed here are greater than 1000 vehicles per day.

7.3.22 The DMRB also sets out thresholds for night time noise. These are identical to the daytime thresholds described above but with an additional lower threshold in terms of absolute noise level, below which effects are deemed to be negligible and therefore no further assessment is required. The absolute noise level threshold is 55 dBA $L_{night}$ (which is actually a $L_{Aeq,\ 8\ hour}$ value and corresponds to the Interim Target in the WHO Night Noise Guidelines[vii]). The method of calculation of $L_{night}$ from traffic flow data can be found in a DEFRA document published for that purpose. Its calculation is based entirely on the daytime LA10, 18 hour derived in accordance with CRTN. If a night noise assessment were to be undertaken on this basis, any changes in night time noise level will be identical to changes in daytime noise level.

7.3.23 Arguably, if a night time noise level of 55 dBA is deemed acceptable then a daytime noise level of the same magnitude would clearly also be acceptable. However it could also be argued that the $L_{night}$ lower threshold of 55 dBA could be reduced to 40 dBA to correspond to the night noise guideline value in the WHO document. Taking the WHO night noise guideline (NNG), interim target (IT) and guidance on daytime noise levels into account, as well as DMRB, we propose that if absolute noise level thresholds were to be used (below which effects are deemed to be negligible) they could be set at 40 dBA during the night and 50 dBA during the day. These levels correspond with those set out in the WHO Guidelines for Community Noise[viii]. It is worth noting at this point that the more recent Night Noise Guidelines are not intended to replace the earlier Guidelines for Community Noise but to be referred to alongside them. Neither document forms part of any statutory requirement in the UK.

7.3.24 In summary, on the basis set out in the above paragraphs, it is appropriate in this case to undertake the assessment purely in terms of changes in Basic Noise Level ($L_{A10,\ 18\ hour}$).

7.3.25 Traffic flows were developed by the traffic consultants, AECOM. The assessment of predicted noise level changes due to traffic flow changes on the local road network is undertaken on the basis shown below where 2016 is understood to be the proposed year of initial works, with 2031 being the expected worst case year within 15 years of this.

- Do Minimum - predicted baseline flows including committed development only
- Do Something - predicted baseline flows including committed development and the proposed development

7.3.26 An additional sensitivity check has been undertaken as agreed with the Local Authority. This check looks at the cumulative impact including an additional site proposed directly to the south of Zone 2, known as Symmetry Park. This is not a committed development, but has been included in a second 2031 Do Something scenario to give a worst case representation should the proposed development be permitted.

7.3.27 The assessment is undertaken for both the 'Do-Minimum' and 'Do-Something' scenarios described in paragraph 7.3.24. The results are set out in the attached Technical Appendix D.5. The Do Minimum (Do Min) and Do Something (Do Som) scenarios are compared, and the impact of the proposed development assessed, as follows:

- 2016 Do Minimum vs 2016 Do Something
- 2016 Do Minimum vs 2031 Do Something
- 2016 Do Minimum vs 2031 Do Something including Symmetry Park
- 2031 Do Minimum vs 2031 Do Something
- 2031 Do Minimum vs 2031 Do Something including Symmetry Park

7.3.28 The proposed assessment criteria for the impact of road traffic upon existing sensitivities are presented in the following table.

7.3.29 It should be noted that the presentation of changes in sound level to one decimal place in the table is not a reflection of the accuracy of any assessment undertaken but rather serves to provide a clear threshold between adjacent impact descriptions.

7.3.30 It is also important to note that where noise impacts are concerned, any identified to be of Major Significance are not necessarily impacts that have effects of greater than local scale. Indeed, where developments of this type are concerned, any noise impacts are likely to be important on a local scale only.

7.3.31 In this case, as set out in the attached Appendix D.5, the noise change for each assessment location did not exceed 2.9 dB. Therefore it was not necessary to refer to the absolute noise levels in column one of the table when establishing the noise impact magnitude.

| Free Field Absolute Noise Level, dB | Change in Noise Level $L_{A10,18h}$ or $LA_{eq,16h}$ | Magnitude of noise impact in short term | Magnitude of noise impact in long term |
|---|---|---|---|
| $L_{Aeq,16h}$ < 50 | 0.0 | No Change | No Change |
| | 0.1 to 0.9 | Negligible | Negligible |
| | 1.0 to 2.9 | Minor | Negligible |
| | ≥ 3.0 | Minor | Minor |
| | | | |
| 50 ≤ $L_{Aeq,16h}$ < 55 | 0.0 | No Change | No Change |
| | 0.1 to 0.9 | Negligible | Negligible |
| | 1.0 to 2.9 | Minor | Negligible |
| | 3.0 to 4.9 | Moderate | Minor |
| | ≥ 5.0 | Moderate | Moderate |
| | | | |
| $L_{Aeq,16h}$ ≥ 55 | 0.0 | No Change | No Change |
| | 0.1 to 0.9 | Negligible | Negligible |
| | 1.0 to 2.9 | Minor | Negligible |
| | 3.0 to 4.9 | Moderate | Minor |
| | 5.0 to 9.9 | Major | Moderate |
| | ≥ 10.0 | Major | Major |

Table 7.3 - Road Traffic Noise Assessment Criteria

7.3.32 It is proposed to undertake realignment works at the junction of Mere Lane and the A5 roadway. These works will include provision of two roundabouts and improvement works along the A5 to the roundabout approaches. These will provide access for vehicles serving the proposed development. One roundabout is located to the south western corner of the Zone 1 site while the second roundabout is located to the north western corner of the Zone 1 site.

7.3.33 The nearest dwellings, within the village of Willey to the south western roundabout, are approximately 650m from the junction works and 450m from the A5 improvement works at the nearest point. The nearest dwellings to the north western roundabout are dwellings at White House Farm at a distance of approximately 250m.

7.3.34 In addition to the assessments described based on traffic flow changes, an indicative assessment has been carried out against the Noise Insulation Regulations[ix]. The Regulations provide certain rights to insulation against increased traffic noise at or above a specified level from new highways, as affecting existing dwellings.

7.3.35 It should be noted that at this stage the Zone 1 development application is in outline only. It is therefore not appropriate at this stage to undertake a full assessment against the Noise Insulation Regulations. However it is useful to carry out an indicative assessment based on the information available.

7.3.36 The assessment, as set out in Appendix D.1: Noise Impact Assessment, indicates that existing residences in the vicinity of the proposed link road are not likely to be eligible for attenuation packages under the Noise Insulation Regulations.

7.3.37 There are no proposed realignments to the national road network as part of the Zone 2 application.

## Construction Noise Assessment

7.3.38 A detailed outline of the recommended standards and criteria against which noise and vibration should be assessed has been developed, as set out in Technical Appendix D.6 Construction Noise Criteria. These include thresholds for noise and vibration levels, at which impacts are expected to arise and at which impacts may become severe if they occur over a long duration or extended period.

7.3.39 In addition, an example code of construction practice, representative of what might be applied to the site, has been set out in Technical Appendix D.7 Example Code of Construction Practice.

7.3.40 It is intended that if the noise levels at the most exposed residential windows exceed stated thresholds for extended periods then some form of mitigation is considered. The aim is to avoid 'major' noise impacts occurring.

7.3.41 It is recommended that prior to commencement of works, the Contractor seeks consent from the Local Authority for a framework for the proposed methods of work and the steps to be taken to minimise noise and vibration. This could be in the form of a Section 61 agreement.

The attached appendices D.6 and D.7 provide construction noise criteria and an example code of practice. The limits set within these aim to limit any increase in the ambient noise level to the "Threshold of significant effect for construction ambient noise" as set out in BS 5228-1:2009 + A1:2014[x].

## 7.4 Baseline Conditions for Zone 1

7.4.1 A noise survey has been undertaken to quantify the baseline exposure levels around the proposed development site.

7.4.2 The methodology and results of the survey are set out in detail in Technical Appendix D.2A.

7.4.3 Survey positions were selected to examine noise levels generated by the A5 road, Mere Lane, and the existing Magna Park facility, along with other environmental noise sources.

7.4.4 The survey positions provided a representation of noise levels at each of the nearest and most exposed noise sensitive receptors.

7.4.5 Where residences are concerned, the following have been identified and agreed upon with Peter Gibson (Environmental Health Officer at Harborough District Council)[3] as representing the closest noise sensitive receptors to Zone 1:

| Ref | Description | Approx. distance and direction from site |
|---|---|---|
| AP1 (To be demolished) | Emmanuel and Lodge Cottages | 0.3 km south east |
| AP2 | Springfields Farmhouse | 0.45 km north east |
| AP3 | Lodge Farm Houses | 1.2 km north by north west |
| AP4 | Residences off A5 at White Farm | 1.7 km north west |

Table 7.4 - Residential Receptors

7.4.6 It is not considered necessary to identify any further residential receptors for assessment, as potential effects at other more distant receptors will be less than those at the identified nearest and most exposed receptors shown in the table above. For example, effects at Ullesthorpe will be less than those assessed at AP2 and AP3, due to the larger separating distance from the proposed development site in the case of Ullesthorpe.

7.4.7 Background sound levels have been established at each of AP2 to AP4 during the noise survey. It was found that noise levels across the site were dominated by road traffic on the A5

[3] Confirmed by Mr Gibson by email 8 September 2015

road, with some contribution from the existing Magna Park development at locations closer to this

7.4.8 The wind direction has a significant bearing on noise levels across the site due to the A5 roadway and in particular at larger distances from the roadway. When the wind direction is from the prevailing south west quadrant (i.e. blowing from the direction of the A5 across the site) noise levels are higher than when from the opposite quadrant. Noise levels near to the scheduled monument were noted to be substantially higher when the wind was from the south west quadrant than when it was from the north east quadrant.

7.4.9 AP1 is no longer considered a noise sensitive receptor as the residential cottages located here have been confirmed to be part of the development site and will be demolished under the development proposals. It has also been confirmed that Bittesby Farm buildings, including Bittesby Cottages, are under control of the applicant and are not currently in residential use, nor will they be in the future. Therefore these buildings are not considered noise sensitive receptors under the impact assessments referred to within this chapter.

7.4.10 The Scheduled Monument of Bittesby Deserted Medieval Village is located in close proximity to the corridor of proposed planting, the closest edge of the proposed built development lies c.420m from the eastern most edge of the Scheduled Monument boundary.

7.4.11 An assessment of noise levels due to the development at the Scheduled Monument has been undertaken as a sensitivity check. The assessment location is referenced AP0 throughout the Technical Appendices.

7.4.12 As set out in Appendix D.1, it is not expected that the baseline noise conditions would change greatly without this development in place in future. Any changes would be expected to be negligible. Therefore it is taken that the baseline noise survey is representative of the baseline conditions in the future 'no development' scenario.

7.4.13 The noise impact assessments, with the exception of the traffic noise assessment, therefore are undertaken on this assumption that the existing baseline noise levels represent those in the future 'no development' scenario' also. The traffic noise assessment provides a future 'no development' to future 'with development' assessment, as described above and shown in Appendix D.5.

## 7.5 Baseline Conditions for Zone 2

7.5.1 A noise survey has been undertaken to quantify the baseline exposure levels around the proposed development site.

7.5.2 The methodology and results of the survey are set out in detail in Technical Appendix D.2B.

7.5.3 Survey positions were selected to examine noise levels generated by the A5 road, A4303, and the existing Magna Park facility, along with other environmental noise sources. The survey positions provided a relatable representation of noise levels at the nearest and most exposed noise sensitive receptors.

7.5.4 Where residences are concerned, the following have been identified and agreed upon with Peter Gibson (Environmental Health Officer at Harborough District Council)[4] as representing the closest noise sensitive receptors:

[4] Confirmed by Mr Gibson by email 8 September 2015

.

| Ref | Description | Approx. distance and direction from site |
|---|---|---|
| AP5 | Cross In Hand Farmhouse | 200m to west of nearest Zone 2 boundary |
| AP6 | Liberty's Hotel | 300m to south of nearest Zone 2 boundary |
| AP7 | Moorbarns Farm, Watling St | 900m to south east of nearest Zone 2 boundary |

Table 7.5 - Residential Receptors

7.5.5 It is not considered necessary to identify any further residential receptors for assessment of Zone 2, as potential effects at other more distant receptors will be less than those at the identified nearest and most exposed receptors shown in the table above. For example, effects at the nearest settlements, Willey and Lutterworth, will be less than those assessed at AP5 to AP7, due to the larger separating distance from the proposed development site.

7.5.6 Similarly noise sensitive receptors identified for Zone 1, as set out in Table 7.4 above, are of such a distance, and screened by the existing Magna Park, that noise effects from Zone 2 development would be much less than that assessed to any of the assessment positions here.

7.5.7 It is not expected that the baseline noise conditions would change greatly without this development in place in future. Any changes would be expected to be negligible. Therefore it is taken that the baseline noise survey is representative of the baseline conditions in the future 'no development' scenario.

7.5.8 The noise impact assessments, with the exception of the traffic noise assessment, therefore are undertaken on this assumption that the existing baseline noise levels represent those in the future 'no development' scenario' also. The traffic noise assessment provides a notional future 'no development' to future 'with development' assessment, as described above and shown in Appendix D.5.

## 7.6 Construction Effects and Mitigation

7.6.1 The proposed development has the potential to give rise to the following effects during construction:

- On site construction noise
- Noise due to construction vehicles accessing the site

7.6.2 The following section sets out the potential effects in more detail.

### Potential Impacts/Issues

7.6.3 Guidance on best practicable means of noise control during construction activities, and an example Code of Construction Practice are set out in Technical Appendix D.6 and Technical Appendix D.7 respectively, based on guidance set out in BS 5228-1. This guidance could be used to form the basis of a Section 61 agreement to control construction noise.

7.6.4 The Appendices also set out suggested noise and vibration limits to be used as a benchmark for construction noise control. Given the large distances between the site and nearest and most exposed receptors, these limits should be straightforward to comply with.

7.6.5 Construction work is temporary in its nature. Therefore any noise associated with this will be limited and cover a short term period.

7.6.6 On the above basis it is expected that noise due to construction would have a Negligible Impact upon the nearest and most exposed noise sensitivities.

### Significance of Predicted Effects

7.6.7 Due to the limited nature of construction works, and the distance of the development site from the nearest and most exposed noise sensitive receptors, the impact of construction noise will be limited. As set out above the magnitude of the impact is considered Negligible.

7.6.8 On this basis, the impact of construction noise relating to this development upon existing sensitivities is assessed as being of Minor Significance.

### Proposed Mitigation

7.6.9 A construction management plan will be in place which will aim to further limit any potential impacts relating to both noise and other environmental elements.

7.6.10 Care will need to be taken to ensure that construction vehicle movements to and from the site are constrained to haul routes avoiding as far as practicable noise sensitive routes. This can generally be achieved by routing vehicles as directly as possible onto the main road network, this being the A5 roadway in this case.

7.6.11 Using best practical means of noise control during construction is expected to control the noise effects to be a Negligible Impact with Minor Significance over the short term. There are no long term impacts associated with construction noise.

## 7.7 Operational Effects and Mitigation

7.7.1 The proposed development has the potential to give rise to the following effects:

- Road Traffic Noise on existing sensitivities
- Operational Activity Noise on proposed sensitivities

7.7.2 The following section sets out the potential effects in more detail.

### Potential Impacts/Issues

7.7.3 The proposed development has the potential to give rise to the following operational noise impacts:

- Increased ambient noise levels ($L_{Aeq}$) due to goods handling operations, such as vehicle movements and loading/unloading noise
- Increased impulsive event noise levels ($L_{Amax}$) due to goods handling operations, such as vehicle movements and loading/unloading noise
- Disturbance due to noise from vehicle reversing sounders
- Disturbance due to noise from fixed plant
- Increases in noise level due to vehicles on existing public highways such as Mere Lane, A4303 and A5 roadways

7.7.4 All of the above listed impacts could potentially occur throughout the operational life of the development. Therefore the impacts are considered in both the short term and long term.

7.7.5 The magnitude of the potential impacts upon the nearest and most exposed noise sensitive receptors would be limited due to the distances involved and the fact that the introduced noise sources do not have a different character to those already in the area.

7.7.6 Noise due to operational activities is assessed as having a Negligible Impact upon the nearest and most exposed noise sensitivities.

7.7.7 Vibration is not considered to be a potential impact for either the Zone 1 or Zone 2 sites, due to the type of operations and activities and the distance of the sites from the nearest and most exposed sensitive receivers, in comparison to other sites and roads with similar activities.

## Significance of Predicted Effects

7.7.8 An assessment has been undertaken of each of the impacts, as set out within this chapter and the attached technical appendices.

7.7.9 The attached Technical Appendix D.1 sets out the operational noise assessment for the proposed Zone 1 and Zone 2 developments. This covers the assessment of ambient noise levels and impulsive event noise levels from on-site operations including noise from vehicle reversing alarms. The assessment also considers the noise impact of traffic on the access road way serving the Zone 1 site.

7.7.10 The assessment has shown that in most cases the noise from the proposed Zone 1 units would be considered to be below the Lowest Observable Adverse Effect Level. In one position, AP4, over a two hour period between 05:00h and 07:00h the LOAEL threshold would be exceeded.

7.7.11 This is considered to relate to an impact of Minor/Moderate Magnitude as there is no intermediate distinction between Lowest and Significant Observable Adverse Effect Level in current guidance to allow a definable distinction between a Minor and Moderate impact.

7.7.12 It is suggested however that the exceedance is this case would relate more closely to a Minor Impact as it is over a two-hour period only, is an exceedance of 1 dB only, and the controlling noise source, being HGV traffic on the access roads, is similar to the existing noise climate which is controlled by the A5 roadway.

7.7.13 For the Zone 2 development site it is shown that the LOAEL may also be exceeded during certain night time hours at one assessment position only, AP6. This is considered to relate to an impact of Minor/Moderate Magnitude as set out above, and under the terms set out in Appendix D.3 requires mitigation where practicable to reduce noise levels.

7.7.14 Again it is suggested however that the exceedance in this case would relate more closely to a Minor Impact as it is over a two-hour period only, is an exceedance of 2 dB only, and the controlling noise source, being industrial activity, is similar to the existing noise climate which is contributed to by the existing Magna Park.

7.7.15 Plant noise limits have been set within Technical Appendix D.1 such that the effect of the plant noise would not increase the overall operational noise levels to above the relevant noise limits at the nearest residential properties and would therefore also be considered Negligible.

7.7.16 An assessment of road traffic noise due to the proposed Zone 1 and Zone 2 developments has been undertaken as set out within section Technical Appendix D.5. An additional sensitivity check has been undertaken considering the impact of a further development currently proposed, but not yet confirmed, known as Symmetry Park. This assessment has shown that the impact in both short and long term of road traffic associated with the proposed development would be limited to one of Negligible magnitude in all cases.

7.7.17 In the case of the road realignments on the A5 and Mere Lane, it has been shown that no dwellings are expected to be eligible for a sound insulation package under the Noise Insulation Regulations.

Based on the assessment of impact magnitude, it is considered that the impact due to operational noise of the development upon existing noise sensitivities is Not Significant as the noise sources are similar to that of the existing noise climate.

### Proposed Mitigation

7.7.18 As set out above, the magnitude of the impacts from the proposed development are considered Negligible at most times and locations, with an impact of Minor/Moderate Significance in the early morning hours at AP4 from Zone 1 and AP6 from Zone 2. This assessment has been undertaken without any mitigation beyond that afforded by careful orientation of the units and location of development elements.

7.7.19 As set out in Appendix D.1, the introduction of a 4m high acoustic screen along the northern side of part of the access road from the north west A5 roundabout would provide suitable control to noise levels at the most exposed receptor, AP4. With this screening in place, the predicted noise levels fall at or below the Lowest Observed Adverse Effect Level at all assessment positions at all times.

7.7.20 The magnitude of the impacts at Zone 2 are considered Negligible to all receptors but one – AP6, Liberty's Hotel. The impact during daytime hours and across most of the night are considered Negligible. It is possible that a Minor/Moderate impact will be observed during some early morning hours, between 05:00 and 07:00 based on the given traffic flows.

7.7.21 In order to reduce noise levels to below LOAEL it would be necessary to introduce a screen of at least 7m height. This is not considered practical due to the associated visual impact, wind loading and structural difficulties in implementation. As the impact from this site is typically Negligible and at worst is considered Minor/Moderate, it is considered that the noise impact from the Zone 2 Site can be considered reasonable.

7.7.22 On this basis, no mitigation is proposed for Zone 2. All operational noise effects have been assessed including on-site movements and activity and changes in road traffic associated with the development. Plant noise limits have been set for the combined effect of all fixed mechanical services plant items.

7.7.23 The operational noise impact from this development is assessed as being of Negligible Magnitude for Zone 1, and of Minor/Moderate Magnitude for Zone 2 in the worst case. The impacts are considered Not Significant due to the type of noise source being equivalent to the existing noise climate, and due to the short amount of time at which the actual impact is considered Minor/Moderate.

## 7.8 Residual Effects

### Construction

7.8.1 Technical Appendix D.6 sets out best practicable means for construction, which are aimed to minimise any noise impacts during the construction phase.

7.8.2 With the recommendations set out in this document, along with a suitable construction management scheme. The noise impact due to construction for this development is considered to be of Negligible Magnitude and Minor Significance at worst, and temporary in any case.

### Operational

7.8.3 The assessment has shown that in each case to the nearest and most exposed noise sensitive receptors the operational noise from the proposed site would be considered to be below the Lowest Observable Adverse Effect Level for Zone 1 and just above the LOAEL for 2 hours at one assessment position for Zone 2. This would relate to an impact of Negligible Magnitude for Zone 1, Minor/Moderate for Zone 2 and being Not Significant in both cases. Noise levels at more distant receptors would be lower and therefore the impact would be the same or less.

7.8.4 Plant noise limits have been set within Technical Appendix D.1 such that the effect of the plant noise would be controlled by design to an impact of no greater than Negligible Magnitude and Not Significant.

7.8.5 An assessment of road traffic noise due to the proposed development has been undertaken as set out within Technical Appendix D.5. This assessment has shown that the impact in both short and long term of road traffic associated with the proposed development would be limited to one of Negligible Magnitude and Not Significant.

## 7.9 Cumulative Effects

7.9.1 Construction works for this development will take place prior to its operation and are expected to be complete before operational activities commence. Consequently it is not necessary to consider the impact of construction noise cumulatively with other noise elements associated with the development.

7.9.2 The conclusions set out in the construction noise section therefore apply to all expected noise sources associated with the development at this stage.

7.9.3 The operational noise assessment considers operational activities on site while measures have set to ensure that noise from fixed plant items does not increase the magnitude of the impact at any of the receptors. The assessment of road traffic noise considers the changes expected due to this development.

7.9.4 The road traffic noise assessment shows a Negligible impact which is Not Significant. The distance from the proposed site to the nearest and most exposed dwelling which is on a relevant road corridor is greater than 1.5 km.

7.9.5 The operational noise assessment at Zone 1 shows a Negligible impact which is Not Significant.

7.9.6 The operational noise assessment at Zone 2 shows a noise impact which is typically Negligible, but potentially could be Minor/Moderate at certain periods in the early morning at one assessment position. The significance of the impact would be Not Significant at all times.

7.9.7 On the above basis the cumulative effect of noise from on-site operations and from road traffic changes associated with the development is not expected to change from a worst case of Negligible (Zone 1) and Minor/Moderate (Zone 2) Magnitude and Not Significant in both the Short and Long Term (15 years after opening) scenarios.

7.9.8 The distance from the proposed Zone 1 site at its nearest point to the closest Zone 2 receptor, AP5, is 1.2km. The distance from the proposed Zone 2 site at its nearest point to the closest Zone 1 receptor, AP2, is 2.2km. Therefore the cumulative impact of both of these sites together is not considered to increase beyond the conclusions of the assessment for each site individually at any of the assessment positions.

### Effects of Other Committed Development

7.9.9 The road traffic noise assessment undertaken includes the effect of known committed development in the area. This assessment has shown that the cumulative effect of road traffic changes due to this and the committed developments would result in an impact of Negligible Magnitude and Significance along each road corridor.

7.9.10 The proposed development at Zone 1 is located at approximately 250m from the nearest existing dwelling or proposed development with all other receptors at much greater distances. Other committed developments are located at much greater distances from the receptors. Therefore there will be no adverse cumulative effects due to noise from operational or construction activities at this and other committed developments.

7.9.11 The proposed development at Zone 2 is located at approximately 200m from the nearest existing dwelling or proposed development with all other receptors at much greater distances. Other committed developments are located at much greater distances from the receptors. Therefore there will be no adverse cumulative effects due to noise from construction activities at this and other committed developments.

7.9.12 Similarly operational noise from Zone 1 and other committed developments would not have a cumulative effect, where noise from the other committed developments is adequately controlled in compliance with national planning policy, due to the distances involved and the low level and significance of the noise impact from this proposed development.

### Multiple Issues Resulting in Cumulative Effects

7.9.13 Environmental impacts which can have a cumulative effect when considered with Noise are Air Quality and Lighting, although other environmental impacts could also have a cumulative effect. The impacts identified in the relevant chapters should be considered alongside the impacts identified in this chapter.

## 7.10 Summary

7.10.1 This chapter has been prepared by Cole Jarman. The study examines the potential noise effects of the proposed development for Magna Park Extension: Hybrid Application on existing noise sensitive locations.

7.10.2 The assessment considers the effects on existing noise sensitivities arising from:

- Road Traffic Noise
- Operational Activity Noise
- Construction Noise

7.10.3 A noise survey was undertaken to help establish the existing baseline noise levels at the nearest and most exposed noise sensitive locations to the proposed development site. These levels were used to set noise criteria at each of the assessment positions, which were chosen represent the most exposed noise sensitivities.

7.10.4 An assessment was then undertaken of the impact of the operational and associated noise upon the assessment positions. It was established that worst case operational noise from the proposed developments is expected to be Negligible for Zone 1, Minor/Moderate for Zone 2 and Not Significant. In order to achieve this it is necessary to introduce some acoustic screening to the north west of the Zone 1 site. Noise limits have been set for all fixed plant items such that this impact would not be increased.

7.10.5 Changes in road traffic noise due to the development and operation of these units have been found to be Negligible and Not Significant in both the Short Term and Long Term cases.

7.10.6 Construction noise which is temporary in nature is expected to be controlled such that any impact is limited to Negligible and of Minor Significance in the short term at worst.

7.10.7 The following table summarises the expected effects and associated significance upon existing noise sensitive locations, taking account of any mitigation.

| Noise Source | Residual Effect | Effect Significance | Duration |
|---|---|---|---|
| **Zone 1 Outline Application** | | | |
| Operational Noise | Negligible | Not Significant | Short Term |
| Operational Noise | Negligible | Not Significant | Long Term |
| Road Traffic | Negligible | Not Significant | Short Term |
| Road Traffic | Negligible | Not Significant | Long Term |
| Construction | Negligible | Minor | Short Term |
| **Zone 2 Detailed Application** | | | |
| Operational Noise | Minor/Moderate | Not Significant | Short Term |
| Operational Noise | Minor/Moderate | Not Significant | Long Term |
| Road Traffic | Negligible | Not Significant | Short Term |
| Road Traffic | Negligible | Not Significant | Long Term |
| Construction | Negligible | Minor | Short Term |
| | | | |

Table 7.5 - Summary of Residual Effects

## 7.11 References

[i] National Planning Policy Framework (NPPF), Department for Communities & Local Government, (2012)

[ii] Noise Policy Statement for England (NPSE), Department for Environment, Food & Rural Affairs, (2010)

[iii] Planning Practice Guidance (PPG), Department for Communities & Local Government (2014)

[iv] BS 4142:2014: Methods for rating and assessing industrial and commercial sound, BSI (2014)

[v] Design Manual for Road and Bridges (DMRB) Volume 11 Section 3 Part 7 (HA 213/08) - Traffic Noise and Vibration, Highways Agency, (2011)

[vi] Calculation of Road Traffic Noise (CRTN), Department for Transport, (1988)

[vii] Night Noise Guidelines for Europe, World Health Organisation (2009)

[viii] Guidelines for Community Noise, World Health Organisation, (1999)

[ix] Noise Insulation Regulations 1975 (Statutory Instrument 1975/1763) and Amendment 1988

[x] BS 5228-1:2009+A1:2014: Code of practice for noise and vibration control on construction and open sites. Noise

# List of Technical Appendices in ES Volume 3

Appendix D 1: Noise Impact Assessment
Appendix D 2A: Zone 1 Noise Survey
Appendix D 2A: Zone 2 Noise Survey
Appendix D 3: Operational Assessment Basis
Appendix D 4: Traffic Assessment Locations
Appendix D 5: Construction Noise Criteria
Appendix D 7: Example Code of Construction Practice

# Appendix D.2A

**Subject:** **Zone 1 Baseline Noise Survey**
**Project:** **Magna Park Extension: Hybrid Application**
**Date:** **September 2015**

## 1 Introduction

1.1 Cole Jarman has been instructed to undertake a noise survey to establish the existing noise climate in the vicinity of a site adjacent to the A5 trunk road near Magna Park, Lutterworth. Reference to Magna Park throughout this document relates to this existing distribution park.

1.2 This Appendix D.2A outlines the details of the baseline noise survey undertaken at positions representative of noise sensitive locations in the vicinity of Zone 1 of the Hybrid Application. The purpose of the survey was to establish baseline noise levels against which any subsequent assessment of operational noise from potential development can be conducted.

## 2 Site Description

2.1 The application site comprises approximately 227 ha of land in two zones. Together, the two zones form the Site of the hybrid planning application which is the subject of the EIA. The red and blue line site boundary plans are presented in Appendix B of the Environmental Statement.

2.2 Zone 1, is a c 220 ha triangular parcel of predominantly agricultural land to the north and north-west of Magna Park, Lutterworth. Zone 1 is the site of the outline proposals for distribution warehousing, the National Centre for Logistics Qualifications and its campus, the small business space and the new estate office, together with the related access, SUDS, country park and service facilities.

2.3 The site comprises agricultural land to the north west of Magna Park, which itself is located to the west of Lutterworth.

2.4 To the south and south east of the site runs Mere Lane, a local road beyond which lies Magna Park.

2.5 To the west and south west is the A5 roadway, which changes from single carriageway to dual carriageway running northwards from Mere Lane. Beyond the A5 is more agricultural land, with Willey Village located approximately 800 m to the west of the north-west corner of Magna Park, beyond the A5.

2.6 To the east and north of the site is further agricultural land beyond which lie residential properties and minor access roads, with Ullesthorpe village located further to the north.

2.7 Nearby noise sensitive locations to the site identified and agreed with Harborough District Council Environmental Health Officer, Peter Gibson[1], are set out on the attached Figure D.2A/SP1 and described as follows:

- Emmanuel and Lodge Cottages[2] on the east side of the A5 approximately 600 m from Magna Park at its nearest point. These are located at the point where A5 changes from single to dual carriageway.
- Dwellings including Springfields Farmhouse, located to the north of Magna Park on Mere Road, approximately 250 m from Magna Park at its nearest point.
- Dwellings including the White House Farmhouse on the east of the A5, approximately 2.2 km north west of Magna Park at its nearest point.
- Dwellings at Lodge Farm on Manor Road approximately 1.6 km north west of Magna Park at its nearest point.

2.8 A number of buildings exist within or are connected to the site. However the noise survey was only concerned with potential noise sensitive receptors outside of the site and unconnected with the site.

2.9 A number of public right of way walking routes cross the agricultural land to the north west of the existing Magna Park. A scheduled monument site is located approximately 800 m to the north west of Magna Park and 350 m to the east of the A5 at their closest points.

# 3 Noise Survey

## 3.1 Timing

3.1.1 In order to quantify the existing noise climate around the site a survey was conducted initially over two long-term (LT) monitoring periods. Unattended monitors were set up at three locations on the proposed site, LT1-LT3, from 14h00 on 12th September until 14h00 on 18th September 2014. An unattended monitor was then set up from 12h00 on 2nd October to 11h00 on 7th October 2014 at position LT4.

3.1.2 Attended 15 minute noise measurements were taken over three consecutive one hour periods, between 11h00 and 14h00 on 18th September 2014 and between 12h00 and 15h00 on 2nd

[1] Confirmed by Mr Gibson by email on 8 September 2015
[2] These Cottages are now confirmed to be demolished as part of the development proposals. Therefore, although referred to throughout this document for completeness in relation to previous reports, these will not be considered noise sensitive receptors in any noise impact assessment for the site.

October. Measurements were at two measurement positions, ST1 and ST2, on 18th September and one short-term (ST) measurement position, ST3, on 2nd October.

3.1.3 Measurement results during these two periods indicated that the wind direction had a significant bearing upon the noise levels, in particular at greater distances from the road. Therefore a third visit was undertaken on 17th October 2014 in order to take measurements at LT2, ST2 and ST3, and at three new measurement positions: ST4, ST5 and ST6.

3.1.4 To be clear, the periods during which noise measurements were undertaken are summarised as follows:

- 12th - 18th September 2014 (Wind direction from the north/north east)
- 2nd - 7th October 2014 (Wind direction from the south)
- 17th - October 2014 (Wind direction from the south)

### 3.2 Monitoring Locations

3.2.1 All monitoring positions are shown on the attached site plan Figure D.2A/SP1 and described below.

LT1 Free field measurement position located 1.5 m above local ground level, approximately 500 m from Lodge farmhouse on Manor Road, approximately 1.5 km to the north west of Magna Park. This measurement position was utilised to represent the noise levels at the farmhouse, with additional attended measurements also used to provide further indications of noise levels in the vicinity of the farmhouse (see ST1 below).

LT2 Free field measurement position located 3 m above local ground level, to the south of White House Farm and approximately 60 m from the A5. This measurement position was utilised to represent the noise levels at the farmhouse. The measurement position is a similar distance from the A5 to that of the rear of White House Farm house. The farm house is on slightly higher ground than that at the measurement location, hence the 3m microphone height.

LT3 Free field measurement position located 1.5 m above local ground level to the north of Magna Park approximately 120 m from the edge of Mere Lane. This measurement position, being the closest point of available access, was utilised to represent Springfield Farmhouse on Mere Road. The measurement position is located a similar distance from Mere Lane and Magna Park as the farm house is.

LT4 Free field measurement position located 1.5 m above local ground level adjacent to Emmanuel and Lodge Cottages to the west of Magna Park, approximately 60 m from the A5. This measurement position was utilised to represent the noise levels at the dwellings, being a similar distance from the A5 to that of the rear of the houses. See footnote 2 on page 2 above regarding the current and future designation of these cottages.

ST1 Free field measurement position located 1.5 m above the ground on the footpath running to the southeast of Lodge Farmhouse on Manor Lane.

ST2 Free field measurement position located 1.5 m above the ground at a location representative of the edge of the scheduled monument.

ST3 Free field measurement position located 1.5 m above the former railway embankment adjacent to the scheduled monument.

ST4 Free field measurement position located 1.5 m above local ground level within the scheduled monument, approximately 470m from the A5.

ST5 Free field measurement position located 1.5 m above local ground level within the scheduled monument, approximately 480m from the A5.

ST6 Free field measurement position located 1.5 m above local ground level within the scheduled monument, approximately 570m from the A5.

## 3.3 Measurements

3.3.1 Measurements were made in terms of $L_{Aeq}$, $L_{Amax}$, $L_{A10}$ and $L_{A90,}$ over 15-minute intervals (except on 17th October at ST2 where a single 5-minute measurement was made); please see attached Glossary of Acoustic Terms for an explanation of noise units used. In the case of the long term monitoring over a day or more, the 1-minute profile data was also recorded for potential subsequent analysis of $L_{Amax}$ events if necessary (these data are not presented here for reasons of conciseness but are available for inspection upon request). Noise measurements were made using the equipment detailed in the following table.

| Item | Manufacturer | Type |
|---|---|---|
| Sound Level Analyser (x2) | Norsonic | 140 |
| Sound Level Analyser | Norsonic | 118 |
| Acoustic Calibrator (x2) | Norsonic | 1251 |
| Weatherproof windshield | Norsonic | 1212 |
| Sound Level Analyser (x3) | Rion | NL-52 |
| Acoustic Calibrator (x3) | Rion | NC-74 |
| Weatherproof windshield (x3) | Rion | WS-15 |
| Sound Level Analyser | Brüel & Kjær | 2231 |
| Acoustic Calibrator | Norsonic | 1212 |

T1 Equipment used during noise surveys.

3.3.2 The sound level analysers were fitted with windshields, with weatherproof kits fitted to the unattended monitors, and were calibrated before and after the measurements to ensure that an acceptable level of accuracy was maintained throughout.

3.3.3 The weather during set up and collection of the first monitoring period on 12th September 2014 was dry and mild with a light north to north easterly breeze and these conditions are

understood to have continued for the duration of the survey to 18th September, barring a period of rainfall in the early morning of 16th September.

3.3.4 The weather during set up of the second monitoring period on 2nd October was dry and overcast with a southerly breeze of varying strength and these conditions are understood to have continued until the evening of 4th October with intermittent wet and windy conditions after this. This allowed sufficient representation of both a weekend and week day and night at the monitoring position.

3.3.5 The weather during the third monitoring period on 17th October was dry and mild with a southerly wind.

3.3.6 The weather data for periods of unattended monitoring was collected from Broughton Ashley weather station IUNITEDK103 (Co-ordinates 52.536, -1.235) via www.wunderground.com. Observations were made at the survey site itself at the start and end of unattended monitoring to establish the wind direction and other weather characteristics.

### 3.4 Monitoring Results, Observations and Processing

3.4.1 The noise measurement results for the unattended elements of this survey are presented in the attached time histories Figure D.2A/TH01-T04. The attached Schedule D.2A/SCH1 sets out the levels measured during attended monitoring, and also sets out the levels measured at unattended monitoring positions during the same time periods for reference.

3.4.2 It was apparent from the monitoring periods that the wind direction has a significant bearing on noise levels due to the A5 roadway across the site, and in particular at a larger distances from the roadway. When the wind direction is from the prevailing south west quadrant (i.e. blowing from the direction of the A5 across the site) noise levels are higher than when from the opposite quadrant. Noise levels near to the scheduled monument were noted to be substantially higher when the wind was in a southerly direction (visits 2 and 3) than when it was in a north easterly direction (visit 1).

3.4.3 The prevailing wind direction is south westerly. However, the lower noise levels measured under the less common north to north easterly wind direction will be used when establishing the baseline at LT1-LT3 and ST1, in order reflect a worst case scenario for the residential locations. The lower baseline noise levels will therefore represent a robust assessment methodology. The noise levels at the scheduled monument under both sets of wind conditions will be taken into account.

3.4.4 The noise climate at all long term measurement positions was noted to be controlled by road traffic noise from the A5 during set up and collection. Agricultural machinery and infrequent aircraft flyovers also contributed to a much lesser degree. Farm machinery movements to the east were noticeable in particular at LT1 during set-up, though they were not dominant. Loading and vehicle movement noise from Magna Park was noticeable and made a minor contribution to the noise climate at LT3. The noise climate at LT4 was very slightly affected by Magna Park but to a degree which was barely detectable during the day (it is possible that at

night the contribution of Magna Park to the noise climate would be more noticeable; this noise source will have been taken into account on the unattended noise monitoring).

3.4.5 The noise climate at attended monitoring positions was controlled by road traffic noise on the A5 roadway with intermittent contribution from local farm traffic. Detailed notes on noise sources affecting attended locations are set out in the attached Schedule D.2A/SCH1.

3.4.6 Analysis of measurements undertaken at ST1 and at LT1, together with observations made at those locations, leads to the conclusion that baseline noise levels measured at LT1 are considered representative of those likely to be experienced at the nearest dwelling on Manor Road to the north east of LT1.

3.4.7 Attended measurements were undertaken at ST2 to ST6 to establish typical daytime noise levels at locations representative of high and low ground around the scheduled monument. Traffic on the A5 was noted to control the noise levels at these locations, under both southerly and north to north easterly wind conditions, albeit with substantially differing noise levels under the two conditions. Magna Park was also just audible at some locations.

3.4.8 Agricultural activity noise, when present, also contributed at these attended measurement locations; therefore the majority of measurements were undertaken only when farmyard activities nearby did not take place, or when noise from these was insignificant in comparison to noise levels from the A5. This ensures a robust baseline, since although agricultural noise forms a normal part of the noise climate in this area, it has been largely excluded from the survey, resulting in lower baseline noise levels than would otherwise be the case.

3.4.9 Based on the unattended noise survey measurements, the resultant day and night time typical weekday and weekend noise levels have been calculated for the site. The weekday daytime indices have also been established for the attended measurement positions. The typical levels in their relevant indices are shown in tables T2 and T3 below.

3.4.10 It can be seen from the results at ST2 (near the scheduled ancient monument) that the wind direction has a significant effect, with typical noise levels under southerly conditions being greater than under north-westerly conditions.

3.4.11 In order to provide an indication of baseline noise levels against which operational noise from any development proposals may be assessed in the future, the typical $L_{A90}$ background noise level was established for the weekday and the weekend day and night periods. This level will be utilised in accordance with BS4142 to set the representative baseline for each of the locations.

| Noise Indices | LT1[A] | LT2[A] | LT3[A] | LT4[B] |
|---|---|---|---|---|
| | | **Typical Representative Weekday** | | |
| $L_{Aeq,16h}$ Day Time (dB) | 40 | 53 | 43 | 62 |
| $L_{Aeq,8h}$ Night Time (dB) | 36 | 49 | 41 | 57 |
| $L_{A10,18h}$ Day Time (dB) | 40 | 56 | 44 | 65 |
| $L_{A90,1h}$ Day | 30 | 43 | 35 | 48 |
| $L_{A90,15min}$ Night | 28 | 29 | 30 | 43 |
| | | **Typical Representative Weekend** | | |
| $L_{Aeq,16h}$ Day Time (dB) | 39 | 52 | 44 | 57 |
| $L_{Aeq,8h}$ Night Time (dB) | 34 | 48 | 40 | 57 |
| $L_{A10,18h}$ Day Time (dB) | 39 | 55 | 44 | 61 |
| $L_{A90,1h}$ Day | 32 | 43 | 36 | 47 |
| $L_{A90,15min}$ Night | 28 | 32 | 29 | 43 |

T2 Measured day and night time free-field noise levels at unattended locations
A - based on north to north easterly wind direction (12-17/09/14)
B - based on wind direction from the south west quadrant (02-07/10/14 and 17/10/14)

| Noise Indices | ST1[A] | ST2 | ST3[B] | ST4-ST6[B] |
|---|---|---|---|---|
| $L_{Aeq,16h}$ Day Time (dB) | 37[i] | 37[A,ii] - 55[B,iii] | 57[iv] | 49 - 51[v] |
| $L_{A90,representative}$ Day Time (dB) | 30[vi] | 34[vi] | 51[vi] | 47[vi] |

T3 Typical measured weekday daytime free-field noise levels at attended locations
i - based on typical measured $L_{Aeq,15min}$ during attended survey on 18/09/14
ii - based on typical measured $L_{Aeq,15min}$ during attended survey on 18/09/14
iii - based on typical measured $L_{Aeq,5min}$ during attended survey on 17/10/14
iv - based on typical measured $L_{Aeq,5min}$ during attended surveys on 2/10/14 & 17/10/14
v - based on typical measured $L_{Aeq,5min}$ during attended survey on 17/10/14
vi - based on typical measured $L_{A90}$ during attended measurement
A - based on north to north easterly wind direction (12-17/09/14)
B - based on wind direction from the south west quadrant (02-07/10/14 and 17/10/14)

# 4 Attachments

**Figure D.2A/SP1**
Site plan showing site and measurement positions

**Schedule D.2A/SCH1**
Schedule of measured noise levels

**Figure D.2A/TH01-T04**
Time Histories of measured noise levels


Cole Jarman

# Figure D.2A/SP1

Title:

Plan showing Zone 1 long term (LT) and short term (ST) noise measurement positions, and most exposed noise sensitive locations

North

Project:

Magna Park Extension: Hybrid Application

Date: September 2015

Revision: -

Scale: Not to scale

**Cole Jarman Limited**
**t** +44 (0)1932 829007 **f** +44 (0)1932 829003

John Cree House, 24B High Street, Addlestone, Surrey KT15 1TN
**e** info@colejarman.com **w** www.colejarman.com

# Attended Noise Survey Results

## Free Field Measurement Position ST1: Representative of farmhouse on Manor Road

| Period | $L_{Aeq}$ | $L_{Amax}$ | $L_{A90}$ | Duration |
|---|---|---|---|---|
| **Survey Date - 18/09/2014** | | | | |
| 1115-1130[i] | 35.7 | 67.6 | 31.2 | 15 mins |
| 1245-1300[ii] | 34.9 | 51.3 | 30.0 | 15 mins |
| 1300-1315[iii] | 39.1 | 56.1 | 29.9 | 15 mins |

**ST1 Notes**

[i] Low-level road traffic noise on A5 and farm vehicle activity, occasional aircraft flyover

[ii] Low-level road traffic noise on A5 and farm vehicle activity, occasional aircraft flyover, motorbike on A5 at12:49

[iii] Low-level road traffic noise on A5 and farm vehicle activity, more frequent aircraft flyover

## Free Field Measurement Position ST2: On embankment adjacent scheduled monument

| Period | $L_{Aeq}$ | $L_{Amax}$ | $L_{A90}$ | Duration |
|---|---|---|---|---|
| **Survey Date - 18/09/2014** | | | | |
| 1145-1200[iv] | 36.9 | 56.9 | 33.8 | 15 mins |
| 1245-1300[v] | 37.2 | 47.8 | 34.1 | 15 mins |
| 1345-1400[vi] | 43.5 | 45.4 | 37.3 | 15 mins |
| **Survey Date – 17/10/2014** | | | | |
| 14:05-14:10 | 55.1 | 63.7 | 51.2 | 5 mins |

**ST2 - Notes**

[iv] Low-level farm vehicle activity not audible, dominated by road-traffic noise from A5 and some aircraft flyovers

[v] Low-level farm vehicle activity just audible, dominated by road-traffic noise from A5

[vi] Low-level farm vehicle activity audible and contributing significantly to levels measured, road-traffic noise from A5 and some aircraft flyovers also contribute

**Free Field Measurement Position ST3: Bottom of embankment nearest A5**

| Period | $L_{Aeq}$ | $L_{Amax}$ | $L_{A90}$ | Duration |
|---|---|---|---|---|
| **Survey Date – 02/10/2014** | | | | |
| 1215-1230[vii] | 56.0 | 65.3 | 48.3 | 15 mins |
| 1245-1300[viii] | 56.4 | 64.8 | 49.1 | 15 mins |
| 1315-1330[ix] | 56.8 | 70.7 | 48.6 | 15 mins |
| 1345-1400[x] | 57.0 | 65.4 | 50.9 | 15 mins |
| 1415-1430[xi] | 59.0 | 72.9 | 53.1 | 15 mins |
| 1445-1500[xii] | 59.1 | 69.2 | 53.0 | 15 mins |
| **Survey Date – 17/10/2014** | | | | |
| 13:45-13:50 | 57.3 | 63.3 | 54.2 | 15 mins |
| 13:55-14:00 | 56.5 | 65.0 | 52.7 | 15 mins |

**ST3 - Notes**

[vii] Controlled by road traffic noise on A5. Distant farm vehicle activity and occasional aircraft flyover contributed. HGV pass-by on A5 dominating (27 over 15 minutes).

[viii] Controlled by road traffic noise on A5. Distant farm vehicle activity and occasional aircraft flyover contributed. HGV pass-by on A5 dominating (42 over 15 minutes).

[ix] Controlled by road traffic noise on A5. Distant farm vehicle activity and occasional aircraft flyover contributed. HGV pass-by on A5 dominating (38 over 15 minutes).

[x] Controlled by road traffic noise on A5. Distant farm vehicle activity and occasional light aircraft flyover contributed. HGV pass-by on A5 dominating (45 over 15 minutes).

[xi] Controlled by road traffic noise on A5. Distant farm vehicle activity and occasional light aircraft flyover contributed. HGV pass-by on A5 dominating (47 over 15 minutes).

[xii] Controlled by road traffic noise on A5. Distant farm vehicle activity and occasional aircraft flyover contributed. HGV pass-by on A5 dominating (49 over 15 minutes).

**Free Field Measurement Positions - 17/10/2014**

| Period | $L_{Aeq}$ | $L_{Amax}$ | $L_{A90}$ | Duration |
|---|---|---|---|---|
| **ST4 – Monument, approximately 470m from A5** | | | | |
| 14:25-14:40 | 49.6 | 57.4 | 46.7 | 15 min |
| 14:45-15:00 | 50.0 | 56.6 | 47.2 | 15 min |
| **ST5 – Monument, approximately 480m from A5** | | | | |
| 15:05-15:20 | 51.2 | 59.7 | 48.7 | 15 min |
| **ST6 – Monument, approximately 570m from A5** | | | | |
| 15:25-15:40 | 49.2 | 63.9 | 45.7 | 15 min |

## Measured Levels at Unattended Positions during Attended Noise Survey

**Free Field Measurement Position LT1 - 18/09/2014: Eastern Unattended Position**

| Period | $L_{Aeq}$ | $L_{Amax}$ | $L_{A90}$ | Duration |
|---|---|---|---|---|
| 1100-1115 | 41.1 | 50.9 | 37.5 | 15 mins |
| 1115-1130 | 40.4 | 53.5 | 37.4 | 15 mins |
| 1130-1145 | 43.1 | 58.4 | 37.8 | 15 mins |
| 1145-1200 | 39.4 | 49.0 | 36.8 | 15 mins |
| 1200-1215 | 39.0 | 53.5 | 36.4 | 15 mins |
| 1215-1230 | 39.9 | 57.7 | 35.5 | 15 mins |
| 1230-1245 | 39.2 | 55.4 | 35.0 | 15 mins |
| 1245-1300 | 39.8 | 54.7 | 35.2 | 15 mins |
| 1300-1315 | 40.2 | 57.9 | 35.4 | 15 mins |
| 1315-1330 | 38.8 | 57.5 | 35.0 | 15 mins |
| 1330-1345 | 41.4 | 59.5 | 34.6 | 15 mins |
| 1345-1400 | 41.9 | 55.1 | 36.2 | 15 mins |

**Free Field Measurement Position LT2 - 18/09/2014: North-western Unattended Position**

| Period | $L_{Aeq}$ | $L_{Amax}$ | $L_{A90}$ | Duration |
|---|---|---|---|---|
| 1100-1115 | 50.8 | 65.3 | 41.4 | 15 mins |
| 1115-1130 | 53.0 | 76.2 | 43.4 | 15 mins |
| 1130-1145 | 54.4 | 80.5 | 42.8 | 15 mins |
| 1145-1200 | 51.8 | 73.0 | 42.2 | 15 mins |
| 1200-1215 | 54.3 | 77.0 | 43.8 | 15 mins |
| 1215-1230 | 52.7 | 73.5 | 41.9 | 15 mins |
| 1230-1245 | 51.4 | 70.7 | 42.4 | 15 mins |
| 1245-1300 | 51.5 | 66.5 | 40.9 | 15 mins |
| 1300-1315 | 53.9 | 75.8 | 43.2 | 15 mins |
| 1315-1330 | 51.9 | 76.1 | 42.0 | 15 mins |
| 1330-1345 | 52.2 | 69.7 | 41.9 | 15 mins |
| 1345-1400 | 52.6 | 67.0 | 44.9 | 15 mins |

**Free Field Measurement Position LT3 - 18/09/2014: South-eastern Unattended Position**

| Period | $L_{Aeq}$ | $L_{Amax}$ | $L_{A90}$ | Duration |
|---|---|---|---|---|
| 1100-1115 | 45.0 | 73.2 | 37.3 | 15 mins |
| 1115-1130 | 47.5 | 76.5 | 37.9 | 15 mins |
| 1130-1145 | 44.5 | 63.2 | 39.8 | 15 mins |
| 1145-1200 | 42.3 | 55.4 | 39.2 | 15 mins |
| 1200-1215 | 41.5 | 63.5 | 37.4 | 15 mins |
| 1215-1230 | 42.3 | 61.8 | 37.9 | 15 mins |
| 1230-1245 | 40.4 | 54.2 | 37.5 | 15 mins |
| 1245-1300 | 40.5 | 58.7 | 36.7 | 15 mins |
| 1300-1315 | 42.9 | 66.8 | 36.2 | 15 mins |
| 1315-1330 | 42.4 | 61.0 | 38.8 | 15 mins |
| 1330-1345 | 44.4 | 58.3 | 39.5 | 15 mins |
| 1345-1400 | 42.2 | 55.0 | 37.0 | 15 mins |

**Free Field Measurement Position LT4 - 02/10/2014: South-western Unattended position**

| Period | $L_{Aeq}$ | $L_{Amax}$ | $L_{A90}$ | Duration |
|---|---|---|---|---|
| 1215-1230 | 49.7 | 67.8 | 43.9 | 15 mins |
| 1245-1300 | 49.3 | 57.9 | 44.2 | 15 mins |
| 1315-1330 | 51.3 | 68.4 | 43.4 | 15 mins |
| 1345-1400 | 51.0 | 61.0 | 45.8 | 15 mins |
| 1415-1430 | 52.3 | 58.6 | 48.9 | 15 mins |
| 1445-1500 | 51.4 | 61.3 | 47.8 | 15 mins |

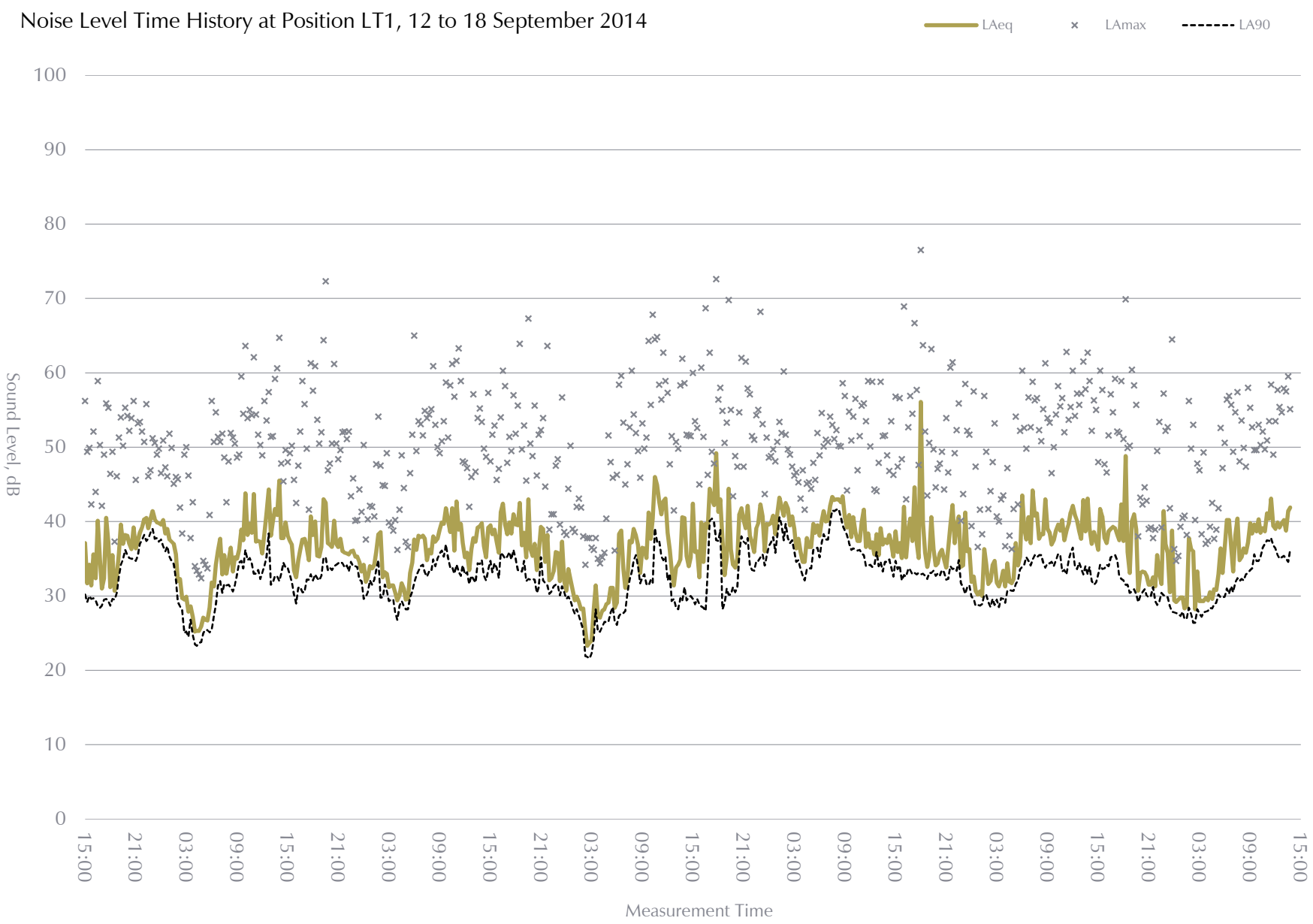



Figure D.2A/TH01

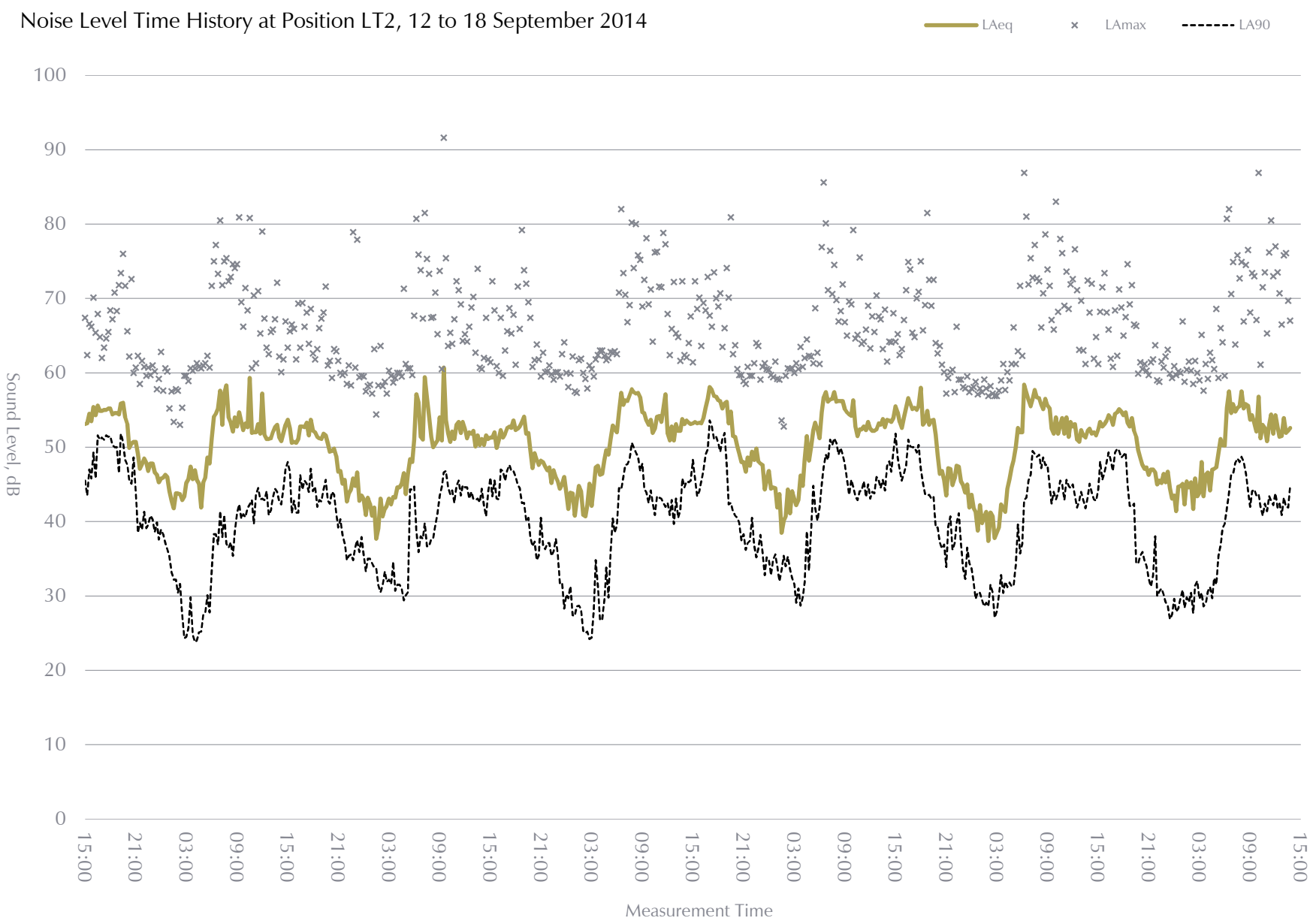
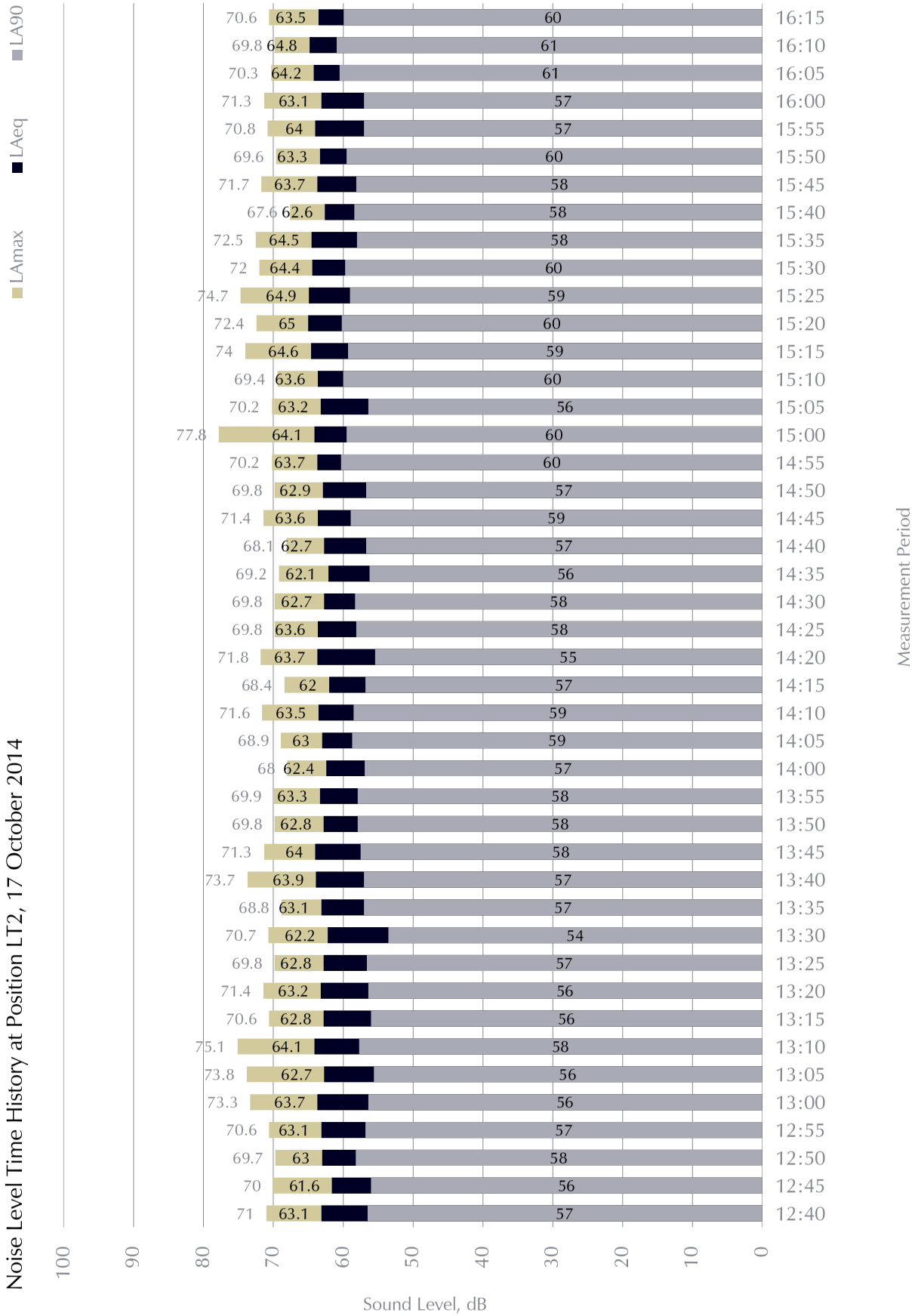



Figure D.2A/TH2A

# Figure D.2A/TH2B



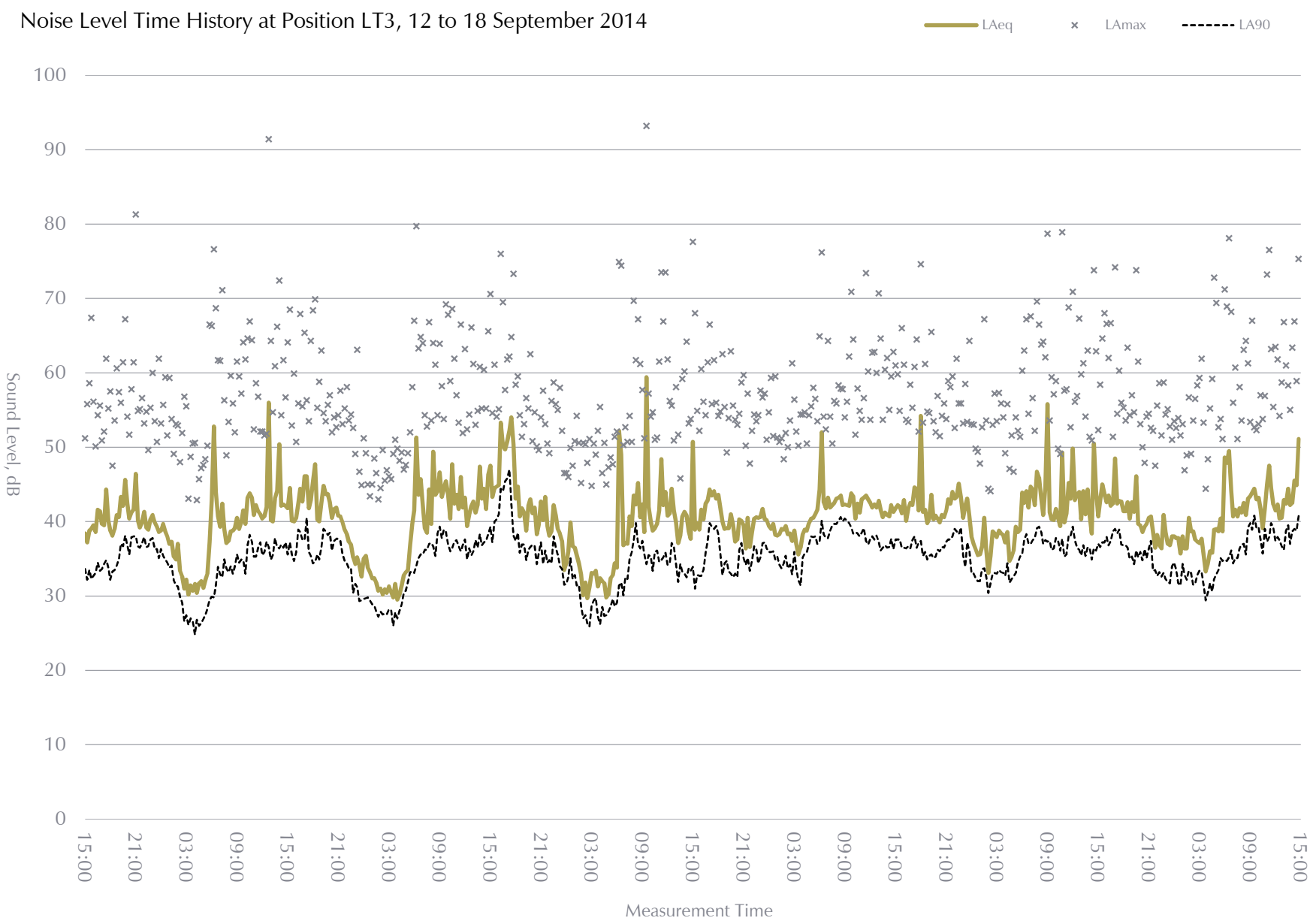



Figure D.2A/TH03

Noise Level Time History at Position LT4, 2 to 7 October 2014

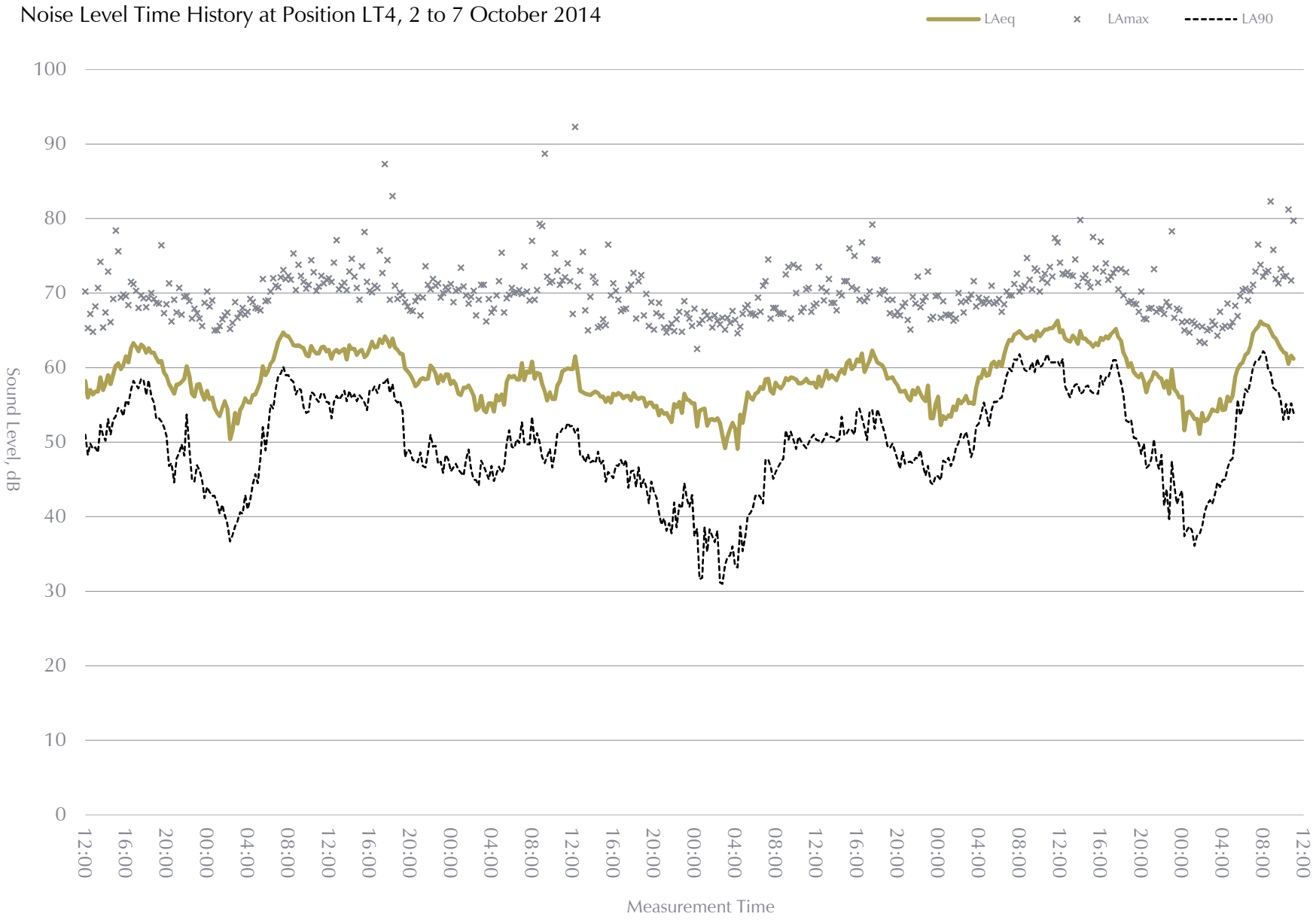



Figure D.2A/TH04

# Appendix D.2B

**Subject:** **Zone 2 Baseline Noise Survey**
**Project:** **Magna Park Extension: Hybrid Application**
**Date:** **September 2015**

## 1 Introduction

1.1 Cole Jarman has been instructed to undertake a noise survey to establish the existing noise climate in the vicinity of a site adjacent to the A5 trunk road near Magna Park, Lutterworth. Reference to Magna Park throughout this document relates to this existing distribution park.

1.2 This Appendix D.2B outlines the details of the baseline noise survey undertaken at positions representative of noise sensitive locations in the vicinity of Zone 2 of the Hybrid Application. The purpose of the survey was to establish baseline noise levels against which any subsequent assessment of operational noise from potential development can be conducted.

## 2 Site Description

2.1 The application site (the Site) comprises approximately 227 ha of land in two zones. Together, the two zones form the Site of the hybrid planning application which is the subject of the EIA. The red and blue line site boundary plans are presented in Appendix B.

2.2 Zone 2, situated approximately 1.0 km to the south east of Zone 1, is a 6.7 ha rectilinear parcel of agricultural land to the rear of the George headquarters building on the A4303 near the junction with the A5 Watling Street trunk road, and close to the main access point to Magna Park. Zone 2 is the site of the detailed proposals for the dedicated Magna Park railfreight shuttle terminal and HGV parking facility.

2.3 The site currently comprises farmland and is located adjacent to the existing ASDA George building. The north west boundary of the site is therefore with these premises.

2.4 The north east and south east boundaries of the site are with farmland.

2.5 The south west boundary currently also comprises farmland; beyond which lies the A5 (Watling Street). The A5 is a busy main road, carrying significant levels of traffic in general and Heavy Goods Vehicles (HGV's) in particular. For the majority of the section running parallel to the site there is a layby on the site side of the road, which is used by HGV's and cars. This section of the A5 is a single-carriageway, two-way road. However a little further south, the road transitions to a dual-carriageway configuration.

2.6 Nearby noise sensitive locations to the site identified and agreed with Harborough District council Environmental Health Officer, Peter Gibson[3], are set out on the attached Figure D.2B/SP1 and described as follows:

- AP5 – Cross In Hand Farmhouse on the opposite side of A5, approximately 200m west of the nearest part of the proposed HGV parking site; and
- AP6 - Liberty's Hotel on the A5, more than 300m approximately south of the site.
- AP7 - Moorbarns Farm, Watling Street, more than 900m approximately south east of the site.

# 3 Environmental Noise Survey

## 3.1 Monitoring Location

3.1.1 All monitoring positions are shown on the attached site plan Figure D.2B/SP1 and described below.

MP1 Unattended noise monitor, to quantify the prevailing noise levels in the vicinity of the site over a number of days. The monitor was located approximately 30m from the edge of the nearest live carriageway of the A5, as shown on attached Figure D.2B/SP1. The microphone was located approximately 1.5m above ground in free field conditions. This location was selected to be representative of noise levels at the locations in paragraph 2.6 above.

MP2 Attended noise monitor located 5m from the kerb of the A5, where the road is in dual carriageway configuration. The microphone was located approximately 1.5m above ground. This location was selected as a verification position, to ascertain whether there is a significant difference in noise levels generated by the single and dual carriageway parts of the A5.

## 3.2 Methodology

3.2.1 Measurements were made using the following instrumentation:

[3] Confirmed by Mr Gibson by email on 8 September 2015

| Item | Manufacturer | Type |
|---|---|---|
| Sound Level Analyser | Norsonic | 118 |
| Sound Level Analyser | Norsonic | 140 |
| Acoustic Calibrator | Norsonic | 1251 |

T4 Equipment used during noise survey.

3.2.2 The analysers were fitted with windshields and were calibrated before and after each part of the survey to ensure a consistent and acceptable level of accuracy.

3.2.3 Measurements at MP1 were made in continuous 15 minute periods from 1500h on Wednesday 12th October until 1300h on Monday 17th October 2011.

3.2.4 Measurements at MP2 were made in terms of a single 15 minute period in each of three consecutive hours on 17th October. The measurement periods were taken simultaneously to measurements undertaken at MP1 to allow a direct comparison.

### 3.3 Results

3.3.1 The results of measurements undertaken at MP1 are set out in attached Figure D.2B/TH01. The results of measurements made at MP2 are set out in attached Schedule D.2B/SCH1.

3.3.2 The two sets of results are comparable, in that similar noise levels are obtained when applying a correction for the difference in distance from the A5 between the two locations. The measurements were used to provide a representative noise level at each of the noise sensitive locations, described as follows:

- AP5 – Cross In Hand Farmhouse, approximately 200m west of the nearest part of the proposed HGV parking site. Represented by measurements undertaken at MP2, at a similar distance from the edge of the A5.
- AP6 – Liberty's Hotel, more than 300m approximately south of the site. Represented by measurements undertaken at MP1 corrected for distance. This presents a pessimistic representation of the noise levels at AP6 as there could be local noise sources increasing the existing noise level. Hence an assessment showing noise levels suitable on this basis would also be considered suitable where such local noise sources occur.
- AP7 - Moorbarns Farm, Watling Street, more than 900m approximately south east of the site. Represented by measurements undertaken at MP1 corrected for distance. This presents a pessimistic representation of the noise levels at AP7 as there could be local noise sources increasing the existing noise level. Hence an assessment showing noise levels suitable on this basis would also be considered suitable where such local noise sources occur.

3.3.3 The noise climate at both positions was dominated by road traffic on the nearby A5 roadway. Noise levels at the measurement positions are in line with those expected in the vicinity of a busy road carrying large numbers of heavy goods vehicles.

3.3.4 Table T5 below sets out the typical daily noise indices for the measurement and assessment positions based on the results of the noise survey at this site.

| Noise Indices | MP1 | MP2[i] | AP5[ii] | AP6[iii] | AP7[iii] |
|---|---|---|---|---|---|
| $L_{Aeq,16h}$ Day Time (dB) | 62 | 69 | 69 | 51 | 43 |
| $L_{Aeq,8h}$ Night Time (dB) | 58 | 65 | 65 | 47 | 39 |
| $L_{A90,15min}$ Day | 47 | 49 | 49 | 36 | <30 |
| $L_{A90,15min}$ Night | 38 | 40 | 40 | <30 | <30 |

T5 Typical measured weekday daytime free-field noise levels at attended locations
i - based on difference between measurements at MP1 and MP2
ii - based on results at MP2
iii - based on results at MP1 with correction for distance based on the road traffic line source

## 3.4 Suitability of Measurement Data

3.4.1 As noted above, the noise measurement for Zone 2 was undertaken in 2011. The noise climate was controlled by road traffic on the A5. As can be seen in the table of flows below, the historic average daily flows associated with both the A5 and the A4303 have increased between 2011 and 2014.

3.4.2 The traffic flows set out in table T6 below from the Traffic Flow Data System (TRADS) database for the A5 roadway and the Department for Transport website for the A4303. The DfT data for the A4303 was converted from Annual Average Daily Traffic (AADT) to Annual Average Weekday Traffic) AAWT using a factor of 1.15.

| Road Location | AAWT 2011 | AAWT 2014 |
|---|---|---|
| A5 South of A4303 | 14,201 | 15,472 |
| A5 North of A4303 | 15,920 | 16,531 |
| A4303 | 17,209 | 19,020 |

T6 Historic traffic flows for relevant roads (AAWT – Annual Average Weekday Traffic)

3.4.3 The change in traffic flow from 2011 to 2014 relates to an increase of between 4% and 11%. The worst case increase of 11% would result in an increase in noise levels due from the road traffic noise of 0.4 dB. On this basis it is considered appropriate to consider the noise levels measured in 2011 as equivalent to the existing noise climate.

3.4.4 Therefore the noise levels measured during this monitoring period are taken as the baseline noise climate representative, if slightly pessimistic, of the existing noise levels at the relevant measurement positions.

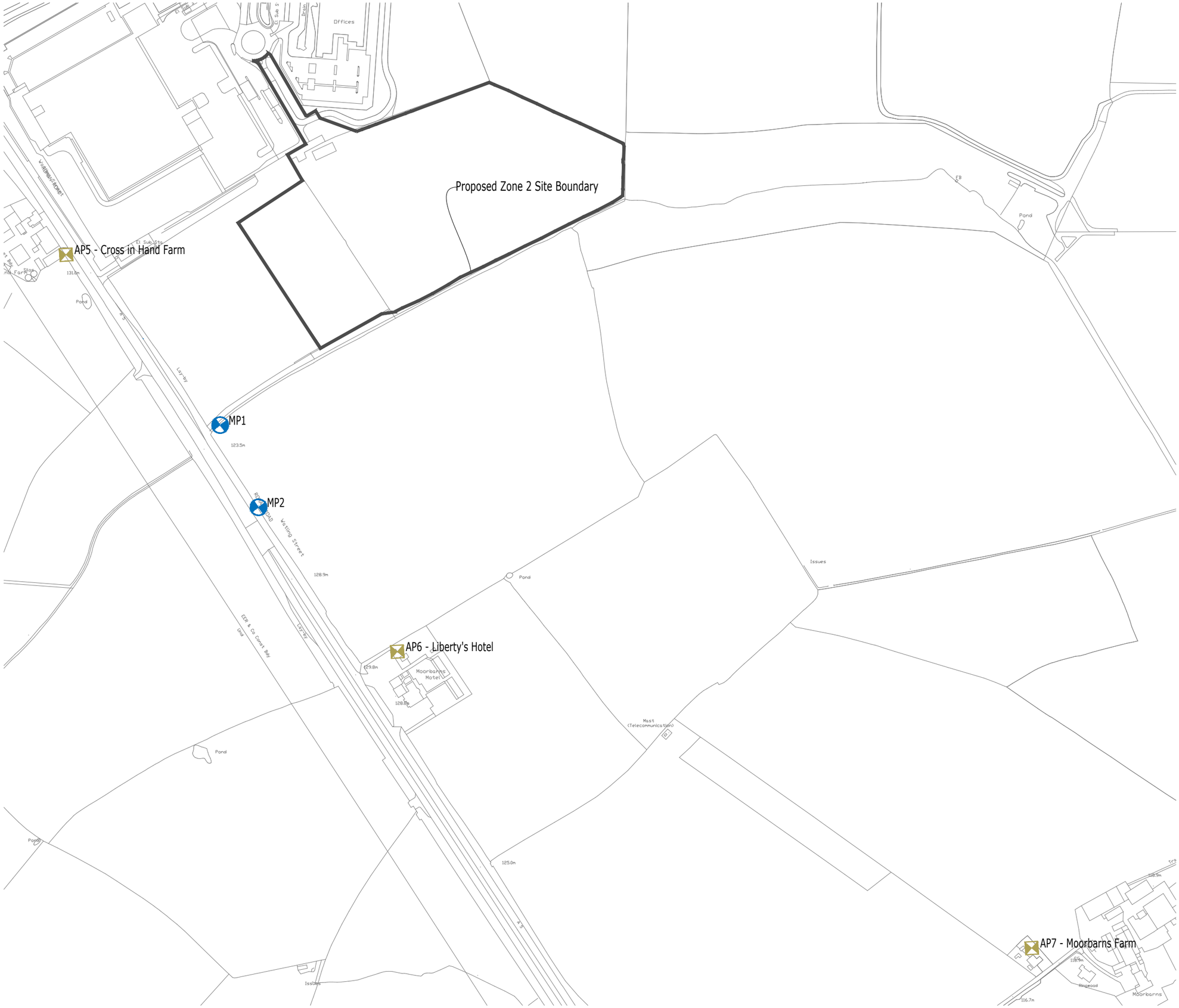
## 4 Attachments

**Figure D.2B/SP1**
Site plan showing site and measurement positions

**Schedule D.2B/SCH1**
Schedule of measured noise levels

**Figure D.2B/TH01**
Time Histories of measured noise levels

End of Section




Cole Jarman

# Figure D.2B/SP1

Title:

Zone 2 Site Plan showing measurement locations (MP) and Assessment positions (AP) at the most exposed noise sensitive locations.

North

Project:

Magna Park Extension: Hybrid Application

Date: September 2015

Revision: -

Scale: Not to scale

**Cole Jarman Limited**
**t** +44 (0)1932 829007 **f** +44 (0)1932 829003

John Cree House, 24B High Street, Addlestone, Surrey KT15 1TN
**e** info@colejarman.com **w** www.colejarman.com

# Noise Survey Results

**Measurement Position 2, 17th October 2011**

| Period | $L_{Aeq}$ | $L_{Amax}$ | $L_{A90}$ |
|---|---|---|---|
| 1100-1200 | 73 | 87 | 58 |
| 1200-1300 | 73 | 86 | 59 |
| 1300-1400 | 73 | 86 | 58 |

**Measurement Position 1, 17th October 2011 at equivalent time periods**

| Period | $L_{Aeq}$ | $L_{Amax}$ | $L_{A90}$ |
|---|---|---|---|
| 1100-1200 | 66 | 77 | 56 |
| 1200-1300 | 66 | 76 | 56 |

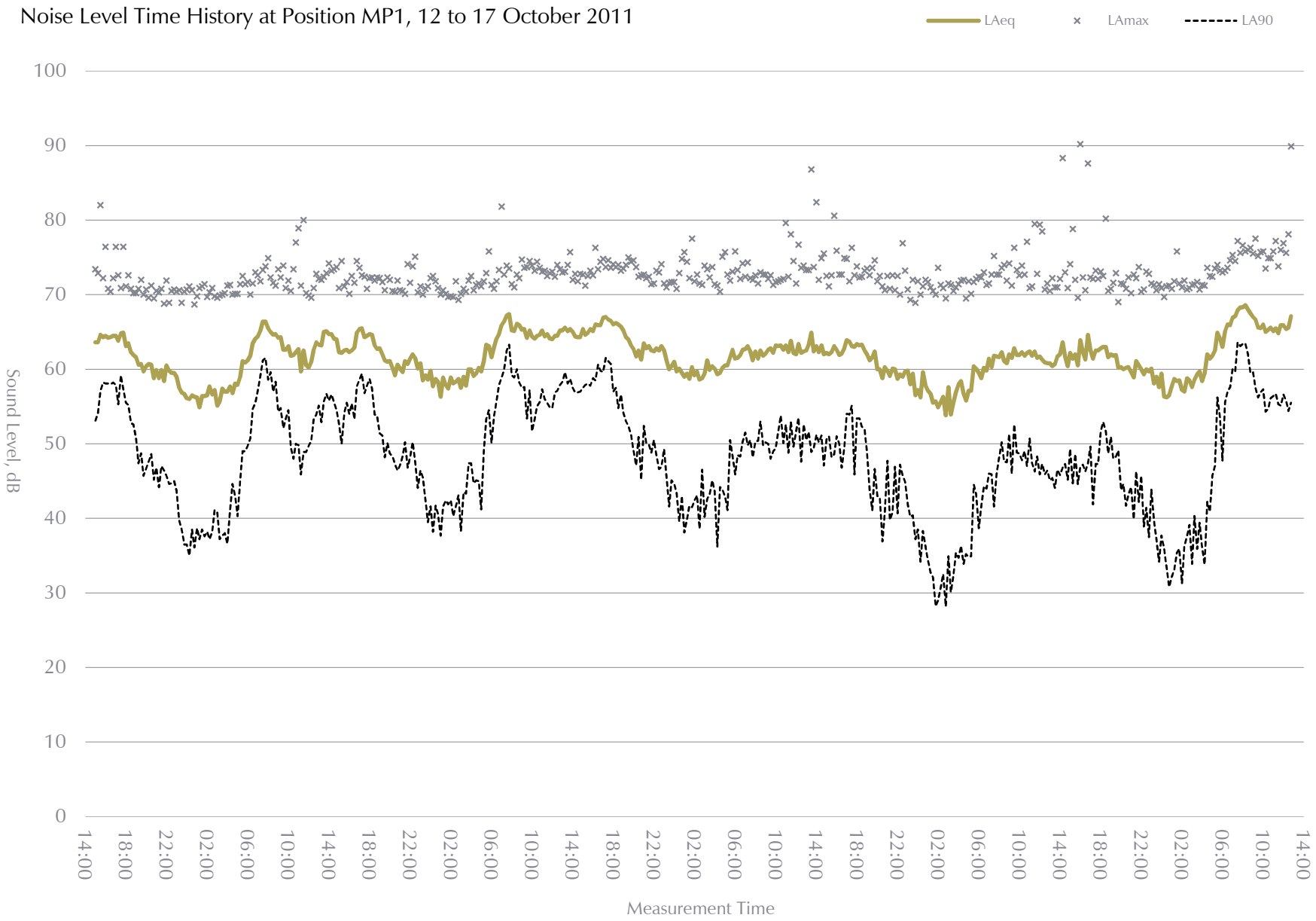



Figure D.2B/TH01

# Appendix D.3

**Subject:** **Operational Noise Assessment Basis**
**Project:** **Magna Park Extension: Hybrid Application**
**Date:** **September 2015**

The following sections set out an overview of noise assessment guidance with respect to development planning in England, including quantification of our interpretation of the effect levels described in the Noise Policy Statement for England and the Planning Practice Guidance on Noise. Section 7 provides a guidance summary.

## 1 National Planning Policy Framework

1.1 National planning policy in England is contained within the National Planning Policy Framework (NPPF) which was published in March 2012. The specific policies of the NPPF that relate to issues of noise are set out below.

1.2 Paragraph 17 states that planning should contribute to conserving and enhancing the natural environment and reducing pollution, seeking to secure high quality design and a good standard of amenity for all existing and future occupants of land.

1.3 Paragraph 109 states that the planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of noise pollution.

1.4 Paragraph 123 states that planning policies and decisions should aim to avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development. Decisions should aim to mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions. Paragraph 123 recognises that development will often create some noise and existing businesses wanting to develop should not have unreasonable restrictions put on them.

1.5 Paragraph 123 refers to the Noise Policy Statement for England, and no other particular standards.

## 2 Noise Policy Statement for England

2.1 The Noise Policy Statement for England (NPSE, which pre-dates and is reflected by the NPPF) does not set quantitative guidelines for the suitability of development in an area depending on the prevailing or expected levels of noise. Absent, therefore, is reference to specific noise thresholds which determine whether noise sensitive or noise generating development is suitable and, if so, whether particular mitigation factors need to be considered. Instead, the NPSE sets out three aims as below.

2.2 The first aim of the Noise Policy Statement for England:

*"Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development."*

2.3 The second aim of the Noise Policy Statement for England:

*"Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development."*

2.4 The third aim of the Noise Policy Statement for England:

*"Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development."*

2.5 Each development site should be judged on its ability to deliver on each of these aims. In this context defining the prevailing noise levels is an essential first step in assessing a given site.

2.6 The NPSE includes the concept of the Significant Observed Adverse Effect Level (SOAEL) and states:

*"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times."*

2.7 It is therefore necessary to assess each site and situation on its own merits and establish SOAEL's etc which relate specifically to those circumstances.

## 3 Planning Practice Guidance (PPG)

3.1 The Department for Communities and Local Government 'Planning Practice Guidance' (PPG) was published on 06 March 2014. The PPG is intended to be read alongside the NPPF and we set out below the guidance that is most relevant to the consideration of noise.

3.2 Part ID30 of the PPG gives guidance on the relevance of noise to a planning decision. Paragraph 003 (ID: 30-003-20140306) states that decision taking should take account of the acoustic environment and in doing so consider the degree of effect associated with the proposal.

3.3 Paragraph 006 (ID: 30-006-20140306) states that various factors need to be considered when assessing the relationship between noise levels and the potential impact on those affected. Paragraph 008 (ID: 30-008-20140306) identifies that noise can be mitigated through engineering, layout, planning conditions/obligations and finally though measures at receivers in areas likely to be affected by noise.

3.4 The PPG makes reference to the NPSE and states at Paragraphs 003 and 004 (ID: 30-003-20140306 and ID: 30-004-20140306) that the aim is to identify where the overall effect of the noise exposure falls in relation to Significant Observed Adverse Effect Level [1] (SOAEL), the Lowest Observed Adverse Effect Level [2] (LOAEL) and the No Observed Effect Level [3] (NOEL).

3.5 Under Paragraph 005 (ID: 30-005-20140306) the guidance then presents a table, which is reproduced as table T1 overleaf. The implication of the final line of the table is that only the 'noticeable and very disruptive' outcomes are unacceptable and should be prevented. All other outcomes (i.e. all other lines in the table) can be acceptable, depending upon the specific circumstances and factors such as the practicalities of mitigation, although effects corresponding to the penultimate line should be avoided.

3.6 Under the topic of further considerations relating to mitigating the impact of noise on residential developments (paragraph 009; ID: 30-009-20140306) the PPG states that the noise impact may be partially off-set if residents of affected dwellings have access to:

- a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling, and/or;
- a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced with increasing noise exposure and could be such that significant adverse effects occur, and/or;
- a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings, and/or;
- a relatively quiet, protected, external publically accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance).

[1] The level of noise exposure above which significant adverse effects on health and quality of life occur.
[2] The level of noise exposure above which adverse effects on health and quality of life can be detected.
[3] The level of noise exposure below which no effect at all on health or quality of life can be detected.

3.7 This is not to say that access to the above items is mandatory, rather that it can help to offset any noise impacts.

| Effect Level (increasing) | Perception | Examples of Outcomes | Action |
|---|---|---|---|
| *No Observed Effect* | Not noticeable | No Effect | No specific measures required |
| ***NOEL*** *(No Observed Effect Level)* | | | |
| *No Observed Adverse Effect* | Noticeable and not intrusive | Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life. | No specific measures required |
| ***LOAEL*** *(Lowest Observed Adverse Effect Level)* | | | |
| *Observed Adverse Effect* | Noticeable and intrusive | Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life. | Mitigate and reduce to a minimum |
| ***SOAEL*** *(Significant Observed Adverse Effect Level)* | | | |
| *Significant Observed Adverse Effect* | Noticeable and disruptive | The noise causes a material change in behaviour and/or attitude, avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area. | Avoid |
| *Unacceptable Adverse Effect* | Noticeable and very disruptive | Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory. | Prevent |

T1 Summary of Noise Exposure Hierarchy (from PPG)

# 4 Ambient Noise Levels

## 4.1 BS 4142 Assessment

4.1.1 Regarding noise impact from a distribution centre, BS 4142:2014 provides an assessment methodology and criteria relating to:

a) sound from industrial and manufacturing processes;

b) sound from fixed installations which comprise mechanical and electrical plant and equipment;

c) sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and

d) sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

4.1.2 The application of the standard is detailed below:

*"This standard is applicable to the determination of the following levels at outdoor locations:*

*a) rating levels for sources of sound of an industrial and/or commercial nature; and*
*b) ambient, background and residual sound levels,*

*for the purposes of:*

*1) investigating complaints;*
*2) assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and*
*3) assessing sound at proposed new dwellings or premises used for residential purposes."*

4.1.3 Therefore, where onsite activity is concerned, the approach taken is in accordance with BS 4142:2014. The rating level of noise from the facility is calculated, over a set time period, at each of the nearest noise sensitive locations. This rating level is then compared with the existing background sound level.

4.1.4 The standard recommends the following reference time period, $T_r$, over which the specific sound should be evaluated, for each of the day and night periods:

- $T_r$ = 1 hour during the day; and
- $T_r$ = 15 minutes during the night.

4.1.5 The standard states that daytime is typically between 07:00 h and 23:00 h. Accordingly, night-time is between 23:00 h and 07:00 h.

4.1.6 The reason for the shorter night time period is identified in the standard as follows:

*"The shorter reference time interval at night means that short duration sounds with an on time of less than 1 h can lead to a greater specific sound level when determined over the reference time interval during the night than when determined during the day."*

4.1.7 The rating level of noise for the assessment periods, $L_{Ar,Tr}$ is the calculated noise level at the nearest receiver location, adjusted depending on the acoustic characteristic of the noise source. Adjustment factors are based on any tonality, impulsivity, intermittency and other sound characteristics present in the resultant noise level at the receiver position. The level or appropriateness of any penalty will depend both on the type of noise source and the context in which it is perceived. Similarly, in accordance with BS 4142, the period of time for which an individual noise source is active during the relevant reference time period will also be considered in establishing the rating level.

4.1.8 The rating level, including appropriate correction factors, will be considered and applied to each source and receiver path individually.

4.1.9 It will also be necessary to consider the existing noise climate and what sound sources contribute to it. For example, where a noise generating activity is proposed adjacent to an existing identical noise generating site, the impact of the new noise source would be less than if it were to be planned in a location where its character and type is different to and more noticeable than any existing noise source nearby.

4.1.10 With regard to the background sound level against which the rating level is compared, the standard states the following:

*"In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods."*

4.1.11 The periods of interest over a 24 hour day are usually related to day time activities (07:00-23:00 h) and night time (23:00-07:00 h). However the standard makes the following statement:

*"Among other considerations, diurnal patterns can have a major influence on background sound levels and, for example, the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes. Furthermore, in this general context it can also be necessary to separately assess weekends and weekday periods."*

4.1.12 Therefore, the periods of time which are typically considered 'waking up' and 'falling asleep' stages, for example 06:00 to 07:00 h and 23:00 to 24:00 h, may need to be considered independently. Alternative periods may also be identified where breakdown beyond the standard day and night time analysis will be necessary, for example where background sound

levels are shown to be regularly elevated. Similarly both weekend and weekday periods may need to be considered separately, with criteria set for both. The requirement to analyse specific time periods will be considered for each site individually.

4.1.13 Once the rating level at each receptor has been calculated reference can be made to the following commentary on BS 4142 in relation to assessing the impact based on the difference between the rating level of the noise source and the pre-existing background sound level.

*a) Typically, the greater this difference [between industrial site noise rating level and background level], the greater the magnitude of the impact.*

*b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*

*c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*

*d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

4.1.14 In addition to the above, BS 4142 also states:

*"For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.*

*Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."*

4.1.15 When assessing whether the existing sound levels are low, it is relevant to refer to other standards which provide absolute thresholds for suitable noise levels inside buildings. These are detailed below.

## 4.2 Amenity and Sleep Disturbance

4.2.1 Where existing ambient noise levels in an area are low at night it has been recognised that these noise levels can be increased without significant detriment to residential amenity.

### WHO Guidelines 1999

4.2.2 In 1999 the World Health Organisation (WHO) published its Guidelines for Community Noise. For outdoor amenity area noise levels during the daytime period the recommendation was to not exceed 50 dB $L_{Aeq,\ 16\ hour}$ to avoid people being moderately annoyed and 55 dB $L_{Aeq,\ 16\ hour}$ to avoid people being seriously annoyed. This latter level may be viewed as the Significant

Observed Adverse Effect Level (SOAEL), above which the noise causes a material change in behaviour and/or attitude, avoiding certain activities during periods of intrusion; quality of life is diminished due to change in acoustic character of the area.

4.2.3 For indoor noise levels during the daytime period, the recommendation was to avoid exceeding 35 dB $L_{Aeq,\ 16\ hour}$ to ensure the noise does not interfere with normal speech. With open windows, this would correspond to approximately 45 dB $L_{Aeq,\ 16\ hour}$ as an external free field noise level. Where there are no other means of ventilation than opening windows, this level can be viewed as the Lowest Observed Adverse Effect Level, below which "noise can be heard but does not cause any change in behaviour or attitude" and above which "noise can be heard and causes small changes in behaviour and/or attitude, e.g. speaking more loudly".

4.2.4 In order to define a level at which effects become unacceptable, it is useful to refer to the Scottish Government Technical Advice Note on Assessment of Noise. Although this advice does not form part of planning policy or guidance in England, it nevertheless contains useful information to put absolute noise levels in context. The advice note indicates at various points that a major adverse impact does not occur in residential areas until daytime noise levels are at least 10 dB above the WHO guideline level of 55 dB $L_{Aeq,\ 16\ hour}$. A level of 65 dB $L_{Aeq,\ 16\ hour}$ could therefore be viewed as corresponding to an unacceptable observed adverse effect.

### WHO Night Noise Guidelines 2009

4.2.5 In 2009 the WHO published its Night Noise Guidelines for Europe (NNG), following a draft published in 2007). The abstract includes the following statement:

*"These guidelines … may be considered as an extension to, as well as an update of, the previous WHO Guidelines for community noise (1999)."*

4.2.6 Table 3 of the executive summary of the NNG sets out effects of different levels of night noise on the population's health. It indicates that an external level of 30 dB $L_{Aeq,\ 8\ hour}$ corresponds to the No Observed Effect Level (NOEL) and that 40 dB $L_{Aeq,\ 8\ hour}$ corresponds to the Lowest Observed Adverse Effect Level (LOAEL). Although it does not explicitly specify a level corresponding to the Significant Observed Adverse Effect Level (SOAEL), the indication is that it is likely to occur at 55 dB $L_{Aeq,\ 8\ hour}$.

### Planning Precedence

4.2.7 In dealing with planning appeals for retail superstores there is precedence that night-time service yard operations can be allowed even in the quietest areas, provided that noise levels do not exceed 45 dB $L_{Aeq,\ 1\ hour}$ due to operations within the service yard at the façades of the nearest residential properties. This corresponds to the daytime threshold for absolute noise levels stated elsewhere in this appendix. However the proposed night time threshold is lower, to ensure it is as robust as possible and in line with national planning guidance and WHO guidelines.

Absolute Noise Level Assessment Criteria

4.2.8 It is worth noting that the WHO guidelines distinguish various types of noise sources including road, rail and air traffic, as well as industry. They do not set industrial noise apart from the others and they do not exclude industrial noise from the sources which can be covered by the guideline values.

4.2.9 It should also be noted that the WHO guideline noise levels discussed above are in terms of day and night period noise levels ($L_{Aeq,\ 16\ hour}$ and $L_{Aeq,\ 8\ hour}$ respectively). BS 4142 uses shorter assessment periods for both the day ($L_{Aeq,\ 1\ hour}$) and night ($L_{Aeq,\ 15\ minute}$). Comparison of such shorter period noise levels with the WHO guideline values can often result in quite different outcomes than comparison of the full day and night period noise levels. When noise sources are not entirely steady, examination of shorter periods will indicate higher specific noise levels than examination of the full day or night period. Using specific noise levels derived from the shorter assessment periods for comparison with the WHO guidelines therefore represent a more stringent method than using the full day and night periods. Reference should also be made to paragraph 4.1.6 above.

4.2.10 In addition, the BS 4142 rating level then includes adjustments for the character of the sound where appropriate. For example if a sound source is highly impulsive, a penalty of 3 dB may be applied if the impulsivity is just perceptible at the receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible. Comparison of a rating level derived in this way with the WHO guideline levels is therefore more stringent than a simple comparison of the specific sound level (without having applied any penalties) with the guideline levels.

4.2.11 For the reasons presented in the preceding two paragraphs, comparison of BS 4142 rating levels ($L_{Ar,Tr}$) with the WHO guideline values represents a robust methodology.

4.2.12 Based on the above discussion, absolute ambient noise level thresholds are proposed along with corresponding recommended actions in table T2 overleaf. It can be seen from the table that where day and night rating levels are equal to or below 45 and 40 dB respectively, no further action or assessment is required.

4.2.13 In addition to these lower-level absolute limits it may be necessary to consider alternative absolute or relative criteria where existing background sound levels are particularly high (see paragraph 4.1.14 above). These would be considered on a site by site basis.

| BS 4142 Rating Level, dB | | Equivalent PPG Effect Level | Action |
|---|---|---|---|
| Day | Night | | |
| $L_{Ar,Tr} < 40$ | $L_{Ar,Tr} < 30$ | No observed effect | No specific measures required |
| $L_{Ar,Tr} = 40$ | $L_{Ar,Tr} = 30$ | NOEL | No specific measures required |
| $40 < L_{Ar,Tr} < 45$ | $30 < L_{Ar,Tr} < 40$ | No observed adverse effect | No specific measures required |
| $L_{Ar,Tr} = 45$ | $L_{Ar,Tr} = 40$ | LOAEL | No specific measures required |
| $45 < L_{Ar,Tr} < 55$ | $40 < L_{Ar,Tr} < 45$ | Observed adverse effect | Mitigate and reduce to a minimum |
| $L_{Ar,Tr} = 55$ | $L_{Ar,Tr} = 45$ | SOAEL | Mitigate and reduce to a minimum |
| $55 < L_{Ar,Tr} \leq 65$ | $45 < L_{Ar,Tr} \leq 55$ | Significant observed adverse effect | Avoid |
| $L_{Ar,Tr} > 65$ | $L_{Ar,Tr} > 55$ | Unacceptable observed adverse effect | Prevent |

T2 Proposed BS4142 assessment criteria for absolute noise levels

4.2.14 It should be borne in mind that each site should be considered on its own merits and in some cases it may be appropriate to define thresholds at different levels to those in the above table.

4.2.15 On the above basis, where day and night rating levels are in excess of 45 and 40 dB respectively, it will be necessary to consider the impact of the proposals with reference to the existing background sound level and climate, in accordance with BS 4142. However such an assessment would also be subject to the primary assessment criteria contained in T2 above, such that there is no need to reduce levels below 45 and 40 dB for the day and night periods respectively, even if the BS 4142 comparative assessment indicates otherwise.

4.2.16 In this case the assessment basis presented in table T3 is proposed where rating noise levels exceed the thresholds identified above, by correlating the impact descriptions in BS 4142 (paragraph 4.1.13 above) and the effect descriptions in planning policy guidance (table T1 under paragraph 3.7 above). The table sets out equivalent PPG effect levels and actions required for various relationships between the rating level of the noise source at the receptor ($L_{Ar,Tr}$) and the background sound level at a location representative of the receptor ($L_{A90,T}$).

| BS4142 Assessment | Equivalent PPG Effect Level | Action required |
|---|---|---|
| $L_{Ar,Tr} < L_{A90,T}$ | No observed effect | No specific measures required |
| $L_{Ar,Tr} = L_{A90,T}$ | NOEL | No specific measures required |
| $L_{A90,T} < L_{Ar,Tr} < L_{A90,T} + 5$ | No observed adverse effect | No specific measures required |
| $L_{Ar,Tr} = L_{A90,T} + 5$ | LOAEL | No specific measures required |
| $L_{A90,T} + 5 < L_{Ar,Tr} < L_{A90,T} + 10$ | Observed adverse effect [4] | Mitigate and reduce to a minimum [5] |
| $L_{Ar,Tr} = L_{A90,T} + 10$ | SOAEL [4] | Mitigate and reduce to a minimum [5] |
| $L_{Ar,Tr} > L_{A90,T} + 10$ | Significant observed adverse effect [4] | Avoid [5] |

T3 BS 4142 assessment criteria for comparative noise levels

4.2.17 It can be seen from the above table that where the rating level is less than or equal to 5 dB above the background level, no action is required. It should also be noted that the thresholds in table T2 also apply, such that there is no need to reduce noise levels below 45 and 40 dB $L_{Ar,Tr}$ for the day and night periods respectively.

4.2.18 Tables T2 and T3 together therefore represent the proposed overall BS 4142 noise assessment methodology in terms of $L_{Aeq}$ (upon which the rating level $L_{Ar,Tr}$ is based).

## 5 General Noise Events of Short Duration

5.1 BS 4142:2014 only calculates the impact of ambient noise levels generated by industrial activities at the nearest noise sensitive dwellings over periods of 15 minutes at night (when potential sleep disturbance is a factor which often needs to be considered). The standard accounts for the impulsivity of noise sources by including methods for adding a penalty, the

[4] Except where $L_{Ar,1hour} \leq 45$ during the day or $L_{Ar,15minute} \leq 40$ dB during the night, in which the effect is equivalent to LOAEL or NOEL.
[5] Except where $L_{Ar,1hour} \leq 45$ during the day or $L_{Ar,15minute} \leq 40$ dB during the night, in which case no specific measures are required for noise occurring during the relevant day or night period

magnitude of which depends on the degree to which the impulsivity is perceptible at a given receptor.

5.2 However in order to provide adequate protection to people trying to sleep in dwellings at night it is often appropriate to consider noise events of short duration with reference to sources of guidance other than BS 4142.

### WHO Guidelines for Community Noise, 1999

5.3 Table 1 of the 1999 WHO document provides guideline values for community noise in specific environments. The relevant guideline value in this situation is 60 dB $L_{Amax}$ as a façade incident level outside bedrooms (which corresponds to approximately 57 dB as a free field level) during the night time, and is based upon the requirement to minimise sleep disturbance.

5.4 However, this criterion is considered to be an aspirational goal and in many locations is regularly exceeded by common environmental and road traffic noise sources.

### WHO Night Noise Guidelines, 2009 (NNG)

5.5 The NNG does not propose any new or updated outdoor $L_{Amax}$ criteria beyond those stated in the 1999 Guidelines for Community Noise.

5.6 In Table 1 under the heading "Thresholds for Observed Effects" (page XIII) various levels corresponding to the onset of observable effects are cited, from 32 to 42 dB $L_{Amax}$, inside. It is stressed that these correspond to the points at which effects start to become observable. In many cases they may not start to become significant until sound levels are much higher.

5.7 However below table 3 on page XVII the following is stated:

*"A number of instantaneous effects are connected to threshold levels expressed in $L_{Amax}$. The health relevance of these effects cannot be easily established. It can be safely assumed, however, that an increase in the number of such events over the baseline may constitute a subclinical adverse health effect by itself leading to significant clinical health outcomes."*

5.8 Under the heading "Relation with the Guidelines for Community Noise (1999)" (page XVIII) the following statements are made:

*"The thresholds are now known to be lower than $L_{Amax}$ of 45 dB for a number of effects."*

*"…to prevent sleep disturbances one should consider the equivalent sound pressure level and the number of sound events. The present guidelines allow responsible authorities and stakeholders to do this. Viewed in this way, the night noise guidelines for Europe are complementary to the 1999 guidelines. This means that the recommendations on government policy framework on noise management elaborated in the 1999 guidelines should be considered valid and relevant for the Member States to achieve the guideline values of this document."*

5.9 The phrase "guideline values of this document" refers to the night period ambient noise level guidance ($L_{Aeq,\ 8\ hour}$) in the NNG. There are no guideline values expressed in terms of $L_{Amax}$ in the NNG.

5.10 Taking the above into account it is considered appropriate to continue to refer to the aspirational guideline $L_{Amax}$ level in the 1999 WHO document, whilst also evaluating the number of occurrences of elevated $L_{Amax}$ levels generated by the new sound source in comparison with pre-existing $L_{Amax}$ noise levels and occurrences. Other guidance should also be referred to, as set out below.

### BS 8233:2014 - Sound Insulation and Noise Reduction for Buildings

5.11 BS 8233 states the following regarding maximum noise levels within houses:

*"Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ depending on the character and number of events per night."*

5.12 The previous edition of BS 8233 included quantitative guidance with respect to night-time $L_{Amax}$ noise levels in bedrooms within dwellings. BS 8233:2014 does not provide such guidance. However in paragraph 7.7.5.1.1 it is noted that the recommendations for ambient noise in hotel bedrooms are similar to those for living accommodation and Table H.3 in Annex H.3 gives example night-time $L_{Amax}$ limits in hotel bedrooms of 45-55 dB. It is noted that night time specifically relates to the period 23:00-07:00 h.

5.13 BS 8233:2014 states the following regarding alternative means of ventilation:

*"If relying on closed windows to meet the guide values, there needs to be appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level."*

5.14 Therefore in the case of areas already subject to high existing maximum noise levels it is understood that achieving an internal noise level of 45-55 dB $L_{Amax}$ with windows open is not considered reasonable. This is because the residents will already be used to the high prevailing noise levels and are likely to already be shutting windows, if required. The addition of new maximum noise levels of a similar or lower level would not alter this behaviour.

5.15 In relation to free field external noise levels, sound insulation from typical single or double glazed windows can be expected to vary between 25 and 30 dB(A) for road traffic type noise sources. Adding this to the minimum $L_{Amax}$ criterion of 45 dB gives an external criterion of between 70 and 75 dB $L_{Amax}$.

5.16 Finally with respect to BS 8233:2014 it should be noted that in the scope it advises that:

*"It is applicable to the design of new buildings, or refurbished buildings undergoing a change of use but does not provide guidance on assessing the effected of changes in the external noise levels to occupants of an existing building."*

### Other Guidance

5.17 In 1991 HMSO published 'Railway Noise - the report of the committee formed to recommend to the secretary of state for transport, a national noise insulation standard for new railway lines'.

5.18 Whilst the document is concerned with railway noise it also reviewed research with respect to sleep disturbance generally. It drew in particular from research by Rice and Morgan, 1982. This noted that in general about 20% of the population have sleeping difficulties that are totally non noise related. They concluded that it was unrealistic to set noise limits to ensure sleep would not be affected in any way by noise. Reviewing various studies they suggested that sleep disturbance is significant when 25% of the population are likely to suffer some disturbance from all causes. Depending upon the noise source, thresholds of 75-85 dB $L_{Amax}$ were proposed. For road traffic noise sources during the night time period 75 dB $L_{Amax}$ was the proposed threshold.

5.19 On other projects where noise impacts from similar activities were considered, the following statement has been upheld at planning appeal.

*"Noise levels for short periods should not exceed 75 dB $L_{Amax}$."*

5.20 In conclusion, there are a number of $L_{Amax}$ criteria relating to external night time noise. The lowest of these, 60 dB from the World Health Organisation, represents an aspirational figure, corresponding to approximately 57 dB as a free field level. Other criteria can be derived varying between 70 and 85 dB.

## 6 Reversing Sounders

6.1 Reversing sounders represent a different type of noise source again and constitute a special case. The principles set out in this section therefore apply only to reversing sounders and not to any other sound sources.

6.2 Reversing sounders are specifically designed to attract attention and they often comprise an intermittent tone. An assessment of $L_{Aeq}$ noise levels is not always appropriate for such an intermittent and distinctive source. Similarly, the previously discussed $L_{Amax}$ criteria may also not be appropriate on their own, due to fact that the noise source is specifically designed to attract attention and has integral tonal and intermittent characteristics.

6.3 Although assessment in accordance with BS 4142 can take account of tonality and intermittency (by making allowance for penalties to account for such features), it may result in a misrepresentation of the noise impact where reversing sounders are concerned. Therefore the principle of adding penalties set out in BS 4142 is used alongside consideration of $L_{Amax}$ for

reversing sounders [6], with reference to the WHO Guidelines for Community Noise, which state:

*"If the noise is not continuous, sleep disturbance correlates best with $L_{Amax}$ and effects have been observed at 45 dB or less. This is particularly true if the background level is low. Noise events exceeding 45 dBA should therefore be limited if possible."*

*"To prevent sleep disturbances, one should thus consider the equivalent sound pressure level and the number and level of sound events. Mitigation targeted to the first part of the night is believed to be effective for the ability to fall asleep."*

6.4 The above quotes indicate that effects can be observed at 45 dB. It does not necessarily indicate that noise levels of this order are likely to give rise to significant adverse effects, just that some effect can be observed. Although the 2009 WHO Night Noise Guidelines state that it is now known that effects can also be observable at lower levels, they do not propose any update to the $L_{Amax}$ guidance in the 1999 Guidelines for Community Noise.

6.5 The internal $L_{Amax}$ noise level of 45 dB in the above quote equates to 60 dB as an external façade incident level and to approximately 57 dB as an external free field level.

6.6 In addition to taking the above WHO guidance into account, it is reasonable to consider the tonality of reversing sounders. As these tonal sounders are specifically designed to attract attention, notable penalties can be applied in this combination of BS4142 and $L_{Amax}$ assessment. A pessimistic total penalty of 12 dB (comprising 6 dB for highly perceptible tonality, 3 dB for intermittency and 3 dB to account for the fact that the sound is specifically intended to attract attention) can be applied to reversing sounders in accordance with BS4142, in order to give a worst case representation of the impact. These penalties are to be considered at each receptor and, where appropriate, applied to the calculated $L_{Amax}$ levels, for subsequent assessment against the aspirational free field noise limit of 57 dB $L_{Amax}$.

6.7 It should again be borne in mind that each situation should be examined on its own merits and there may be cases where deviation from the above methodology is appropriate (for example in a case where conditions are such that the tonality of a reversing sounder would not be considered as highly perceptible at a given receptor).

6.8 It is stressed that the principles set out above are specific to the special case of reversing sounders and are not applicable to other sound sources.

[6] It should be noted that an $L_{Amax}$ level from a reversing sounder can be thought of as akin to a short (e.g. 1 second) $L_{Aeq}$; the $L_{Amax}$ level is likely to be sustained for the duration for which the sounder actually sounds. This would not normally be the case for other noise sources.

# 7 Guidance Summary

## 7.1 General Notes

7.1.1 It should be noted that the following refers to external free-field noise levels. It must also be noted that it is a guideline only; in certain situations assessment criteria may be different.

## 7.2 Rating Levels for Site Noise

7.2.1 Where the rating level of the development at any given receptor is below the Lowest Observable Adverse Effect Level (LOAEL) in absolute terms, no further action or assessment is necessary. The LOAEL is considered to correspond to free field levels of 45 dB $L_{Ar,\ 1\ hour}$ during the day and 40 dB $L_{Ar,\ 15\ minute}$ during the night.

7.2.2 It should be noted that this rating level will include all BS 4142 penalties for tonality and distinctive features. Therefore comparison to the noise levels referred to in BS 8233 and WHO guidelines represents a robust assessment.

7.2.3 Where the rating levels exceed the thresholds identified above, further BS 4142 assessment is carried out with reference to table T3 under paragraph 4.2.16 above.

### Apportionment

7.2.4 It is the intention that limits derived using the rating level methodology will apply to the total combined noise level from an industrial site. This may include both B2 (general industrial) and B8 (storage or distribution) uses, both of which may include items of fixed building services plant.

7.2.5 To provide maximum flexibility for B8 uses, it is often desirable to set limits for B2 use and for fixed plant associated with B2 and B8 use at a level 10 dB lower than the overall limits for the site. This allows the B8 use to operate up to the overall site limit.

## 7.3 Impulsive Noise

7.3.1 Where night time impulsive noise is concerned the Lowest Observable Adverse Effect Level (LOAEL) is considered to correspond to a free field level of 57 dB $L_{Amax}$.

7.3.2 Therefore where development includes impulsive events giving rise to night time noise levels of 57 dB $L_{Amax}$ or less, no action or mitigation is required.

7.3.3 Where development gives rise to night time noise levels in excess of 57 dB $L_{Amax}$ mitigation should be implemented to reduce noise levels to 57 dB or less, or as close to 57 dB as reasonably practicable.

7.3.4 Where existing noise levels already typically exceed 57 dB $L_{Amax}$ it would be reasonable to ensure development noise levels do not exceed existing $L_{Amax}$ noise levels in both level and typical rate of occurrence.

## 7.4 Reversing Sounders

7.4.1 Where development noise events from sources designed specifically to attract attention (such as reversing sounders) are concerned, night time noise levels should again not exceed 57 dB $L_{Amax}$ to ensure the LOAEL is not exceeded. However a penalty of up to 12 dB should be applied to account for the fact that reversing sounders are specifically designed to attract attention and they exhibit tonal and intermittent characteristics.

End of Section

# MAGNA PARK Extension

## HYBRID PLANNING APPLICATION:

15/01531/OUT

**Addendum to the Environmental Statement –**
**the Grant of Planning Permission for DHL Supply Chain 15/00919/FUL**

Volume 3B.3: Appendices D.4A Traffic Assessment Locations and D.5A Road Traffic Noise Assessment to the Addendum ES Section 5: Noise and Vibration

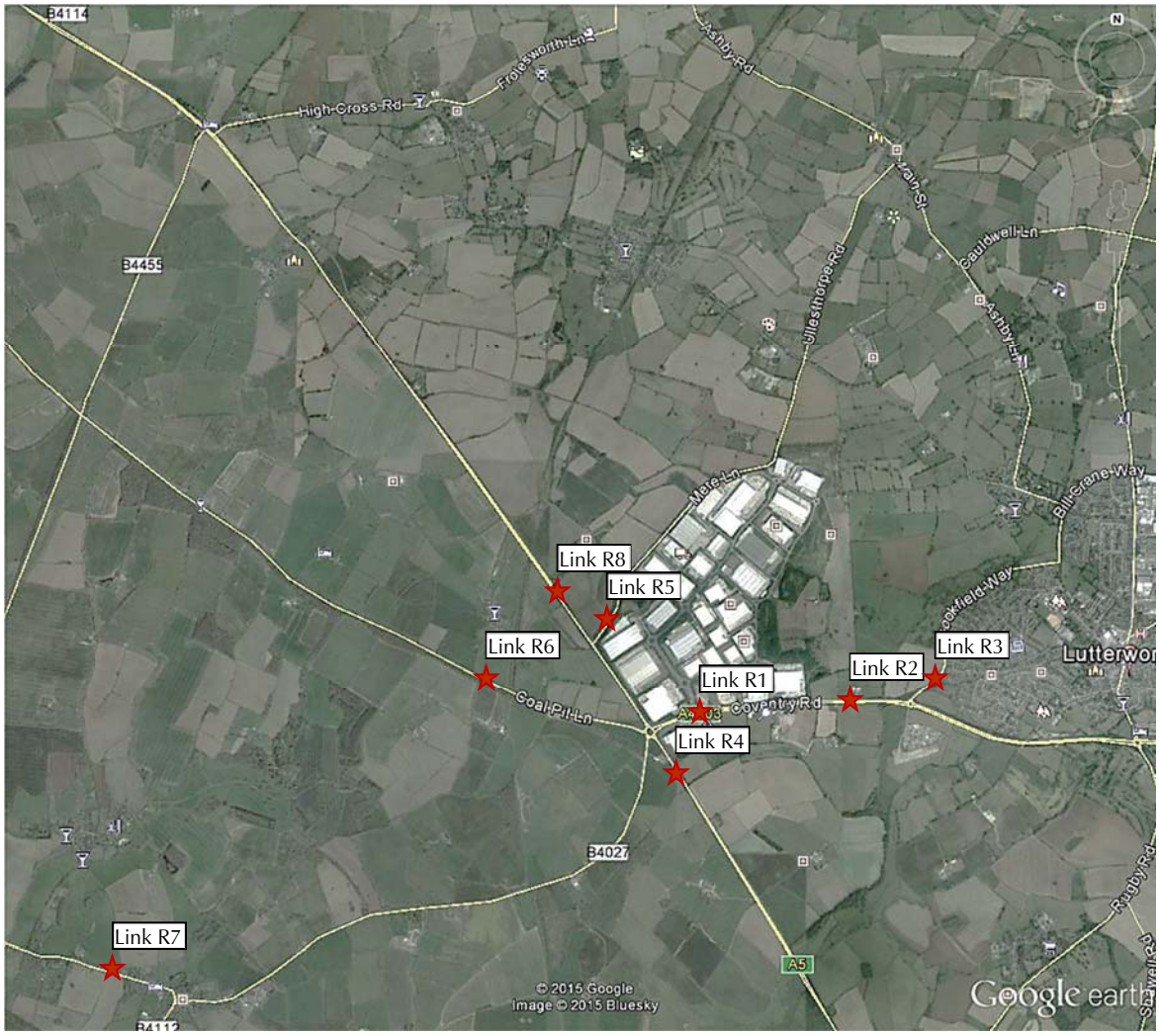
1 November 2016

www.idigazeley.com

IDI Gazeley

Cole Jarman

# Appendix D.4A




Title: Traffic Assessment Locations

Project: Magna Park Extension: Hybrid Application

Date: October 2016

Scale: Not to scale

**Cole Jarman Limited** Reg. in England and Wales No. 7102436
**t** +44 (0)1932 829007 **f** +44 (0)1932 829003

John Cree House, 24B High Street, Addlestone, Surrey, KT15 1TN
**e** info@colejarman.com **w** www.colejarman.com

# Appendix D.5A

**Subject:** **Road Traffic Noise Assessment**
**Project:** **Magna Park Extension: Hybrid Application**
**Date:** **October 2016**

## Road Link Descriptions

| Road Link | Road Link Description |
|---|---|
| Link R1 | Hunter Boulevard |
| Link R2 | A4303 East of Magna Park |
| Link R3 | Coventry Road |
| Link R4 | A5 South of A4303 |
| Link R5 | Mere Lane |
| Link R6 | Coal Pit Lane |
| Link R7 | B4027 West of Pailton |
| Link R8 | A5 North of Mere Lane |

**Cole Jarman Limited** Reg. in England and Wales No. 7102436
**t** +44 (0)1932 829007 **f** +44 (0)1932 829003
John Cree House, 24B High Street, Addlestone, Surrey, KT15 1TN
**e** info@colejarman.com **w** www.colejarman.com

**Schedule 1 (Short Term)**
**2019 Do-Minimum - with committed development only**
***versus***
**2019 Do-Something - with proposed development and committed development**

| Road Link | Description | 18-hour traffic flow | | Change in Noise Level, dB $L_{A10,\ 18\ hour}$ | Effect Magnitude |
|---|---|---|---|---|---|
| | | 2019 Do-Min | 2019 Do-Som | | |
| R1 | Hunter Boulevard | 17,112 | 18,238 | 0.3 | Negligible |
| R2 | A4303 East of Magna Park | 22,009 | 23,135 | 0.3 | Negligible |
| R3 | Coventry Road | 8,478 | 8,768 | 0.1 | Negligible |
| R4 | A5 South of A4303 | 17,607 | 17,935 | 0.1 | Negligible |
| R5 | Mere Lane | No Sensitivities along relevant section of road corridor | | | |
| R6 | Coal Pit Lane | 4,590 | 4,800 | 0.2 | Negligible |
| R7 | B4027 West of Pailton | 5,198 | 5,505 | 0.2 | Negligible |
| R8 | A5 North of Mere Lane | 18,796 | 19,270 | -0.1 | Negligible |

**Schedule 2 (Long Term)**
**2019 Do-Minimum - with committed development only**
***versus***
**2034 Do-Something - with proposed and committed development**

| Road Link | Description | 18-hour traffic flow 2019 Do-Min | 18-hour traffic flow 2034 Do-Som | Change in Noise Level, dB $L_{A10,\ 18\ hour}$ | Effect Magnitude |
|---|---|---|---|---|---|
| R1 | Hunter Boulevard | 17,112 | 17,237 | 0.0 | None |
| R2 | A4303 East of Magna Park | 22,009 | 26,571 | 0.7 | Negligible |
| R3 | Coventry Road | 8,478 | 10,745 | 1.0 | Negligible |
| R4 | A5 South of A4303 | 17,607 | 22,968 | 1.0 | Negligible |
| R5 | Mere Lane | No Sensitivities along relevant section of road corridor | | | |
| R6 | Coal Pit Lane | 4,590 | 5,620 | 0.9 | Negligible |
| R7 | B4027 West of Pailton | 5,198 | 5,944 | 0.6 | Negligible |
| R8 | A5 North of Mere Lane | 18,796 | 24,254 | 0.8 | Negligible |

**Schedule 2A (Long Term)**
**2019 Do-Minimum - with committed development only**
***versus***
**2034 Do-Something - with proposed development and committed development and Symmetry Park**

| Road Link | Description | 18-hour traffic flow 2019 Do-Min | 18-hour traffic flow 2034 Do-Som | Change in Noise Level, dB $L_{A10,\ 18\ hour}$ | Effect Magnitude |
|---|---|---|---|---|---|
| R1 | Hunter Boulevard | 17,112 | 18,727 | 0.4 | Negligible |
| R2 | A4303 East of Magna Park | 22,009 | 33,996 | 2.1 | Negligible |
| R3 | Coventry Road | 8,478 | 12,562 | 1.9 | Negligible |
| R4 | A5 South of A4303 | 17,607 | 25,380 | 1.6 | Negligible |
| R5 | Mere Lane | No Sensitivities along relevant section of road corridor | | | |
| R6 | Coal Pit Lane | 4,590 | 7,061 | 2.0 | Negligible |
| R7 | B4027 West of Pailton | 5,198 | 7,333 | 1.6 | Negligible |
| R8 | A5 North of Mere Lane | 18,796 | 30,726 | 2.2 | Negligible |

**Schedule 3 (Long Term)**
**2034 Do-Minimum - with committed development only**
***versus***
**2034 Do-Something - with proposed development and committed development**

| Road Link | Description | 18-hour traffic flow 2034 Do-Min | 18-hour traffic flow 2034 Do-Som | Change in Noise Level, dB $L_{A10,\ 18\ hour}$ | Effect Magnitude |
|---|---|---|---|---|---|
| R1 | Hunter Boulevard | 17,237 | 18,727 | 0.4 | Negligible |
| R2 | A4303 East of Magna Park | 26,571 | 30,800 | 0.7 | Negligible |
| R3 | Coventry Road | 10,745 | 11,862 | 0.4 | Negligible |
| R4 | A5 South of A4303 | 22,968 | 24,204 | 0.3 | Negligible |
| R5 | Mere Lane | No Sensitivities along relevant section of road corridor | | | |
| R6 | Coal Pit Lane | 5,620 | 6,517 | 0.5 | Negligible |
| R7 | B4027 West of Pailton | 5,944 | 7,113 | 0.7 | Negligible |
| R8 | A5 North of Mere Lane | 24,254 | 29,685 | 0.9 | Negligible |

**Schedule 3A (Long Term)**
**2034 Do-Minimum - with committed development only**
***versus***
**2034 Do-Something - with proposed development and committed development and Symmetry Park**

| Road Link | Description | 18-hour traffic flow 2034 Do-Min | 18-hour traffic flow 2034 Do-Som | Change in Noise Level, dB $L_{A10,\ 18\ hour}$ | Effect Magnitude |
|---|---|---|---|---|---|
| R1 | Hunter Boulevard | 17,237 | 18,727 | 0.4 | Negligible |
| R2 | A4303 East of Magna Park | 26,571 | 33,996 | 1.3 | Negligible |
| R3 | Coventry Road | 10,745 | 12,562 | 0.9 | Negligible |
| R4 | A5 South of A4303 | 22,968 | 25,380 | 0.5 | Negligible |
| R5 | Mere Lane | No Sensitivities along relevant section of road corridor | | | |
| R6 | Coal Pit Lane | 5,620 | 7,061 | 1.2 | Negligible |
| R7 | B4027 West of Pailton | 5,944 | 7,333 | 1.0 | Negligible |
| R8 | A5 North of Mere Lane | 24,254 | 30,726 | 1.1 | Negligible |

End of Section

## About IDI Gazeley

IDI Gazeley is one of the world's leading investors and developers of logistics warehouses and distribution parks with 60 million square feet of premier assets under management and additional prime land sites to develop another 45 million square feet of distribution facilities near major markets and transport routes in North America, Europe and China.

For more information, please visit:

www.idigazeley.com

# Appendix D.6

**Project:** **Construction Noise Criteria**
**Subject:** **Magna Park Extension: Hybrid Application**
**Date:** **September 2015**

## 1 Construction Noise Criteria

1.1 In order to assess the effects of construction noise and vibration, it is necessary to establish standards below which the impact is considered to be acceptable. Hence, if an assessment indicates that the standards are likely to be exceeded, alternative construction methods would need to be considered or specific means of mitigation adopted. Proposed construction noise criteria are set out in the table below. The construction noise criteria refer to the **total** ambient noise level including existing sources and construction noise. The criteria are based on guidance given in Annex E of BS 5228-1:2009[1].

| **Period** | **Time** | **Façade $L_{Aeq}$ in any daytime period [2]** | |
|---|---|---|---|
| | | **Impact Threshold** | **Mitigation Threshold** |
| 1 | 07:00h to 19:00h Monday to Friday | 65 | 70 |
| 2 | 07:00h to 13:00h Saturday | 65 | 70 |
| 3 | 19:00h to 23:00 Monday to Friday | 55 | 70 |
| 4 | 13:00h to 23:00 Saturday | 55 | 70 |
| 5 | 23:00h to 07:00h Monday to Friday | 45 | 60 |
| 6 | 07:00h to 23:00h Sundays | 55 | 60 |
| 7 | 23:00h to 07:00h Saturday and Sunday | 45 | 60 |

T1 Proposed Construction Noise Criteria for AP2 Springfields Farmhouse

[1] BS 5228-1:2009 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (including updated appendix A1:2014)
[2] Maximum noise levels ($L_{Amax,Slow}$) shall be no more than 10 dB above the specified $L_{Aeq}$ level.

| Period | Time | Façade $L_{Aeq}$ in any daytime period [3] | |
|---|---|---|---|
| | | Impact Threshold | Mitigation Threshold |
| 1 | 07:00h to 19:00h Monday to Friday | 65 | 70 |
| 2 | 07:00h to 13:00h Saturday | 65 | 70 |
| 3 | 19:00h to 23:00 Monday to Friday | 55 | 70 |
| 4 | 13:00h to 23:00 Saturday | 55 | 70 |
| 5 | 23:00h to 07:00h Monday to Friday | 45 | 60 |
| 6 | 07:00h to 23:00h Sundays | 55 | 60 |
| 7 | 23:00h to 07:00h Saturday and Sunday | 45 | 60 |

T2 Proposed Construction Noise Criteria for AP3 Lodge Farmhouses

| Period | Time | Façade $L_{Aeq}$ in any daytime period [4] | |
|---|---|---|---|
| | | Impact Threshold | Mitigation Threshold |
| 1 | 07:00h to 19:00h Monday to Friday | 65 | 70 |
| 2 | 07:00h to 13:00h Saturday | 65 | 70 |
| 3 | 19:00h to 23:00 Monday to Friday | 55 | 70 |
| 4 | 13:00h to 23:00 Saturday | 55 | 70 |
| 5 | 23:00h to 07:00h Monday to Friday | 55 | 60 |
| 6 | 07:00h to 23:00h Sundays | 55 | 60 |
| 7 | 23:00h to 07:00h Saturday and Sunday | 50 | 60 |

T3 Proposed Construction Noise Criteria for AP4 Residences at White Farm

[3] Maximum noise levels ($L_{Amax,Slow}$) shall be no more than 10 dB above the specified $L_{Aeq}$ level.
[4] Maximum noise levels ($L_{Amax,Slow}$) shall be no more than 10 dB above the specified $L_{Aeq}$ level.

| Period | Time | Façade $L_{Aeq}$ in any daytime period [5] | |
|---|---|---|---|
| | | Impact Threshold | Mitigation Threshold |
| 1 | 07:00h to 19:00h Monday to Friday | 70 | 75 |
| 2 | 07:00h to 13:00h Saturday | 70 | 75 |
| 3 | 19:00h to 23:00 Monday to Friday | 65 | 70 |
| 4 | 13:00h to 23:00 Saturday | 65 | 70 |
| 5 | 23:00h to 07:00h Monday to Friday | 60 | 65 |
| 6 | 07:00h to 23:00h Sundays | 60 | 65 |
| 7 | 23:00h to 07:00h Saturday and Sunday | 60 | 65 |

T4 Proposed Construction Noise Criteria for AP5 Cross In Hand Farmhouse

| Period | Time | Façade $L_{Aeq}$ in any daytime period [6] | |
|---|---|---|---|
| | | Impact Threshold | Mitigation Threshold |
| 1 | 07:00h to 19:00h Monday to Friday | 65 | 70 |
| 2 | 07:00h to 13:00h Saturday | 65 | 70 |
| 3 | 19:00h to 23:00 Monday to Friday | 55 | 70 |
| 4 | 13:00h to 23:00 Saturday | 55 | 70 |
| 5 | 23:00h to 07:00h Monday to Friday | 45 | 60 |
| 6 | 07:00h to 23:00h Sundays | 55 | 60 |
| 7 | 23:00h to 07:00h Saturday and Sunday | 45 | 60 |

T5 Proposed Construction Noise Criteria for AP6 Liberty's Hotel

[5] Maximum noise levels ($L_{Amax,Slow}$) shall be no more than 10 dB above the specified $L_{Aeq}$ level.
[6] Maximum noise levels ($L_{Amax,Slow}$) shall be no more than 10 dB above the specified $L_{Aeq}$ level.

| Period | Time | Façade $L_{Aeq}$ in any daytime period [7] | |
|---|---|---|---|
| | | Impact Threshold | Mitigation Threshold |
| 1 | 07:00h to 19:00h Monday to Friday | 65 | 70 |
| 2 | 07:00h to 13:00h Saturday | 65 | 70 |
| 3 | 19:00h to 23:00 Monday to Friday | 55 | 70 |
| 4 | 13:00h to 23:00 Saturday | 55 | 70 |
| 5 | 23:00h to 07:00h Monday to Friday | 45 | 60 |
| 6 | 07:00h to 23:00h Sundays | 55 | 60 |
| 7 | 23:00h to 07:00h Saturday and Sunday | 45 | 60 |

T6 Proposed Construction Noise Criteria for AP5 Dwellings at Moorbarns Farm

1.2 The rationale behind these evaluation standards can be summarised as follows:

- Once the construction noise levels are as high as the prevailing noise levels, they will elevate the prevailing noise levels by 3 dB or more, leading to a noticeable change in the overall levels and an impact of increasing severity depending on the actual noise level increase.
- If the noise level at a noise sensitive receptor reaches or exceeds a value that is 10 dB above the daytime ambient $L_{Aeq}$ then the typical increase in noise conditions would generally be considered a Severe impact if the increase were long term or permanent in nature.
- At an external level of 70 dB $L_{Aeq}$ modern thermal double glazing would be expected to be able to control transmission into a building such that it does not exceed an internal value of 40 to 45 dB $L_{Aeq}$. At this level during the daytime most normal residential, commercial and healthcare activities would be able to be carried out without significant disruption. This is based on guidance contained in BS 8233:2014 and BS 5228-1:2009 + A1:2014.
- Therefore where construction noise levels above 70 dB $L_{Aeq}$, or equivalent mitigation thresholds for non-daytime periods, are predicted, some form of mitigation at the source or the receiver is indicated as being desirable, or some other provision may be made to minimise the impact.
- The time limits are based on typical permitted construction working hours. Specific information on allowable working hours and limitations should be sought from Harborough District Council.

[7] Maximum noise levels ($L_{Amax,Slow}$) shall be no more than 10 dB above the specified $L_{Aeq}$ level.

## 2 Vibration Criteria

2.1 With regard to standards for vibration during construction, these have been developed with reference to the documents and recommended values set out below.

| Document | Onset of Effect of Vibration on People | Onset of Potential Cosmetic Damage to Buildings |
|---|---|---|
| BS 5228:1992:Part 4[8] | 0.15 – 0.30 $mms^{-1}$ PPV | 10.0 $mms^{-1}$ PPV |
| DIN 4150:1986:Part 3[9] | 0.2 $mms^{-1}$ PPV | 5.0 – 20.0 $mms^{-1}$ PPV |
| BS 6472:2008[10] | 0.2 $ms^{-1.75}$ $VDV_{day}$<br>0.1 $ms^{-1.75}$ $VDV_{night}$ | N/A |

T7 Proposed Vibration Criteria

2.2 It is worth noting that the 0.2 $mms^{-1}$ PPV (Peak Particle Velocity) referred to in DIN 4150 and BS 6472 is around the human threshold of perception of vibration, although there is some variation between individuals.

2.3 Taking all these factors together, we propose that all construction processes that are likely to generate a vibration level in excess of 1.0 $mms^{-1}$ PPV at any location within any nearby sensitive building, are subject to a more detailed assessment to determine whether mitigation measures are appropriate. That assessment should be undertaken with a view to establishing not only the levels of vibration likely to be generated but also the duration and frequency of their occurrence so that Vibration Dose Values (VDVs) can be calculated and compared to the relevant standards. If these are also exceeded, then mitigation measures or alternative means of carrying out particular activities will need to be investigated.

## 3 Section 61 Agreements and Code of Construction Practice

3.1 The Environmental Protection Act 1990 gives Local Authorities powers to control noise from construction sites by reference to Sections 60 and 61 of the Control of Pollution Act 1974 (COPA). Section 61 facilitates a process by which a Contractor agrees a method of working with a Local Authority, often stipulating hours and methods of working and occasionally agreeing specific noise limits at sensitive locations. The advantage of such an agreement is that compliance with it protects the Contractor from being served with a notice to cease works on account of the noise and vibration impact. The Local Authority has the power under Section 60 of COPA to serve such a notice if it deems the construction noise to be causing a nuisance.

3.2 As a means of minimizing the risk of noise disturbance and disruption, the Developer may make it a contractual obligation for the Contractor(s) to establish Section 61 Agreements (or similar) with the Local Planning Authority for the works to be carried out. The content of those

[8] British Standard 5228: 1992: Noise control on construction and open sites: Part 4.
9 Deutche Norm 4150: 1992: Erchutterungen im Bauwesen – Einwirkungen auf Menschen in Gebauden.
10 British Standard 6472: 2008: Evaluation of human exposure to vibration in buildings (1Hz to 80Hz).

agreements cannot as yet be defined in detail, but the following areas might be discussed and included.

- Hours of working: limited to those times when the sensitivity of affected parties nearby is not so acute.
- Methods and types of plant: particular construction or demolition methods may be disallowed on the site due to the severity of the noise typically generated, as may certain types of plant.
- Low noise plant and noise mitigation: directives on the selection of low noise plant where practical may be included as well as specific types of mitigation for equipment or processes which lend themselves to the same.
- Noise limits: occasionally and under specific circumstances it may be appropriate to set noise limits for certain periods and at certain locations.
- Monitoring, liaison and reporting: the agreement may specify that noise and vibration monitoring is required at certain locations for record keeping and evaluation purposes. Particular parties responsible for liaison and reporting to the local planning authority and other nominated parties may also be identified.

3.3 Section 61 Agreements can be a valuable tool which will enable the local authority to control the noise impact from construction activity while giving the Contractor an agreed framework within which the operations can be carried out. This minimises the risk of disruption to operations without leading to unacceptable consequences for noise sensitive parties. In order to demonstrate the method of control that would be imposed by the Employer on any Contractor undertaking construction works on the site, Appendix D.7 contains an example for a Code of Construction Practice dealing with noise and vibration generation.

End of Section

# Appendix D.7

**Project:** **Example Code of Construction Practice**
**Subject:** **Magna Park Extension: Hybrid Application**
**Date:** **September 2015**

## 1 Example Code of Construction Practice

1.1 Prior to commencement of works, the Contractor is to seek the Local Authority's formal consent via a Section 61 application (Control of Noise and Pollution Act 1974) or similar framework for the proposed methods of work and the steps to be taken in order to minimise noise and vibration.

1.2 It is anticipated that the Local Authority requirements would be similar to the requirements set out within this Appendix. Compliance with the requirements in this appendix should however in no way compromise full compliance with any other requirements agreed with the Local Authority.

1.3 The normal working hours within the site shall be Mondays to Fridays between 0700 and 1900 hours and Saturdays between 0700 and 1300 hours, with no working on Sundays or Public Holidays. Exceptionally, consent for work outside these hours may be given after any necessary consultation, particularly with the Environmental Health Officer (EHO). Fourteen days' notice should normally be required from the Contractor when seeking such consent.

1.4 The noise levels scheduled below for periods outside normal working hours shall only be permitted when consent has been given to exceptional working.

1.5 It should be noted that this Code of Construction Practice is an example document only.

## 2 Ambient Noise Levels

2.1 The ambient noise level, $L_{Aeq,T}$ from all sources when measured 1.5m above the ground at any noise sensitive receiver position shall either not exceed the appropriate level given in the agreed Schedule or not exceed by more than 3dB(A) the existing ambient noise level, $L_{Aeq,T}$, at the receiver location measured over the same period, whichever is the greater.

## 3 Maximum Noise Levels

3.1 The maximum sound level, $L_{Amax,S}$ measured 1.5m above ground at noise control stations shall either not exceed the appropriate maximum noise levels given in the agreed Schedule or not exceed by more than 3dB(A) typical existing maximum noise level exposures, whichever is the greater. The maximum sound level given in the Schedule shall be permitted for a period not exceeding 5 minutes in any one hour.

3.2 Existing ambient noise level data shall be monitored at or near the noise sensitive receiver locations prior to commencement of the works. The updated data should be made available to the Contractor. It should act as the baseline existing ambient noise level data with which compliance with the requirements set out is to be tested. The data should either be measured at or corrected to be representative of the pre-existing noise levels at the noise sensitive positions and provided in terms of hourly $L_{A90}$, $L_{Aeq}$ and $L_{Amax,S}$ noise indices.

3.3 Exceptionally, the Contractor may be given permission to carry out works which exceed the noise levels in the Schedule, provided that 14 days notice of the date and timing of the work is given and the Contractor demonstrates that he has taken all reasonable measures to mitigate the noise nuisance. After consultation with the Local Authority and any other interested bodies a decision would normally be given within 7 days of receipt of the notice.

3.4 If the need arises to measure noise levels at a location other than one of the designated noise sensitive locations, the permitted noise level shall be related to the nearest designated noise sensitive location. The permitted noise levels at another location shall take into account the difference in distance, topography and screening between the noise source and the nearest designated noise sensitive location and the noise source and the measuring location.

3.5 Example proposed construction noise criteria for Assessment Position AP1 are set out in the table below.

| Period | Hours | Total Noise Levels at Designated Noise Sensitive Locations[i] | | |
|---|---|---|---|---|
| | | **Ambient Total Noise Level $L_{Aeq,T}$, dB[ii]** | **Period T over which Ambient $L_{Aeq,T}$ is applicable** | **Maximum Construction Sound Level $L_{Amax,S}$[iii]** |
| Assessment Location | | AP2 | | AP2 |
| Mondays to Fridays | 0700-1900 | 65 | any 4 hours | 75 |
| Mondays to Fridays (if permitted) | 1900-2300 | 55 | any 1 hour | 65 |
| | 2300-0700 | 45 | any 1 hour | 55 |
| Saturdays | 0700-1300 | 65 | any 4 hours | 75 |
| Saturdays (if permitted) | 1300-2300 | 55 | any 1 hour | 65 |
| | 2300-0700 | 45 | any 1 hour | 55 |
| Sundays (if permitted) | 0700-2300 | 55 | any 1 hour | 75 |
| | 2300-0700 | 45 | | 55 |

T1 Example Construction Noise Criteria for Assessment Position AP2 Springfields Farmhouse

Table Notes:
[i] Construction noise levels in the schedule relate to free-field conditions, where designated noise sensitive locations are located more than 3.5m from building façades or other reflective surfaces other than the ground. Where noise designated noise sensitive locations are located within 1.0m from building façades, the permitted noise levels can be increased by 3 dB(A).
[ii] The ambient noise level, $L_{Aeq,T}$ at a designated noise sensitive location is the total $L_{Aeq}$ from all the noise sources in the vicinity over the specified period.
[iii] The maximum sound level, $L_{Amax,S}$ shall be the highest value indicated on a sound level meter which meets the requirements of BS EN 60651, Type 1 or 2 set to SLOW response and frequency weighting A or on an integrating – averaging sound level meter to BS EN 60804.

3.6 The Contractor shall employ the best practical means to minimise the noise and vibration produced by his operations and shall have regard to the recommendations in BS5228: Part 1: 2009 "*Noise Control on Construction and Open Sites*" and BS5228: Part 4: 1992 "*Code of Practice for noise and vibration control applicable to piling operations*".

3.7 Without prejudice to the generality of the Contractor's obligations set out above the Contractor shall comply in particular with the following requirements:-

- All vehicles and mechanical plant used for the purpose of carrying out the works shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order so that extraneous noises shall be reduced to a minimum.

- All compressors and generators shall be "sound reduced" models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use. All ancillary pneumatic percussion tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers. Generators shall be positioned and enclosed so as to minimise noise transmission to the inhabitants in the neighbourhood as agreed with the Employers Agent.

- All pumps shall be positioned and enclosed so as to minimise noise transmission to inhabitants in the neighbourhood.

- All machines in intermittent use shall be shut down in the intervening periods between work or, where this is impracticable, throttled down to a minimum.

- No machine shall be permitted which uses a system of dropping a heavy weight, power assisted or by gravity, for the purpose of breaking up paving or foundations.

- Access to the Site shall be such as to ensure a minimum of disturbance to persons in adjacent buildings by vehicles or plant entering or leaving the Site. No deliveries to Site shall take place outside the agreed working hours.

- Any work agreed to be carried out between 1800 and 0800 hours will be subject to agreement to noise levels with Environmental Health Officer. The Contractor shall provide details on work involved, machinery or plant used, exact location, and calculated noise levels at monitoring points.

3.8 Any fixed or static plant operating outside normally permitted working hours shall not give rise to a 'rating level', as defined in BS4142:2014 "*Methods for rating and assessing industrial and commercial sound*" in excess of the existing free-field background $L_{A90}$ noise levels at noise control stations. The existing baseline free-field background noise levels are to be provided as explained earlier.

3.9 Without prejudice to the foregoing and to requirements of particular clauses in the Conditions of Contract, the Contractor shall not be permitted to carry out works as stated below, except where such work is absolutely necessary for the saving of life or property and the safety of the Works or as is required under the terms of the Contract.

3.10 Piling, including sheet piling, by percussive methods should not be undertaken outside the hours of 0700 to 1900 Mondays to Fridays.

3.11 The maintenance of mechanical or other constructional plant in the proximity of noise sensitive buildings outside the hours of 0700 to 1900 on Mondays to Saturdays or at any time on Sundays and public holidays.

3.12 All construction operations shall be such that they do not exceed a peak particle velocity vibration level of 5 mm/s at any nearby sensitive location as well as the VDV's set out in the table below in the relevant areas.

| **Areas** | **VDV 07:00h to 23:00h** | **VDV 23:00h to 07:00h** |
|---|---|---|
| Residences | 0.20 | 0.10 |
| Commercial Buildings | 0.20 | 0.40 |

T2 Construction Vibration Dose Value

End of Section