

Magna Park Extension: Hybrid Application

Noise Impact Assessment

Appendix D.1

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Attachments

Figure D.1/SP1

Combined Zone 1 and Zone 2 site plan showing assessment positions

Schedule D.1/SCH1

Schedule of archive noise source levels

Schedule D.1/SCH2

Predicted traffic flows

Schedule D.1/SCH3

Activity Description

Schedule D.1/SCH4

Outline Application (Zone 1) Assessment Results

Schedule D.1/SCH5

Detailed Application (Zone 2) Assessment Results

Figure D.1/F1

Mitigation measures for Zone 1

Plan D.1/NM1

Noise Management Plan Principles for site operations

Glossary of Acoustic Terms

Relevant Environmental Noise Chapter Appendices

Appendix D.2A

Noise Survey Report for Zone 1 (Outline Application)

Appendix D.2B

Noise Survey Report for Zone 2 (Detailed Application)

Appendix D.3

Operational Assessment Basis



1 Description of Development, Location and Site

1.1 Introduction

- 1.1.1 It is proposed to submit a hybrid planning application to develop land to the north west of the existing Magna Park distribution centre off the A5 near Lutterworth. The land is proposed to site a number of distribution warehouses dealt with under an outline application along with ancillary facilities such as office space and a Logistics Institute of Technology, dealt with under an outline application. In addition, a detailed application is provided for a proposed Rail Freight Shuttle Terminal.
- 1.1.2 This report outlines the details of a noise impact assessment undertaken by Cole Jarman of operational noise from the proposed Magna Park Extension: Hybrid Application development. It clarifies the methodologies set out in Appendix D.3 adopted for the assessment of potential operational noise effects and the results of the assessment undertaken.
- 1.1.3 The baseline noise survey report, setting out the methodology and conclusions of noise survey work undertaken across the site accompanies this Technical Appendix in Appendix D.2A and Appendix D.2B.

1.2 Development Description

- 1.2.1 The application will be in outline, save for the railfreight shuttle terminal proposed for Zone 2. This shuttle terminal will be served by shuttles running from the nearby rail freight terminal. While some shuttles will go directly to the relevant distribution unit, a number will unload containers at the shuttle terminal, where they will be stored until required by the distribution unit. At this point a tug will transfer container to the unit in question.
- 1.2.2 The development comprises the following uses and maximum quanta:

Zone 1 (outline):

- Distribution warehousing and ancillary office space (Use Classes B8 and B1a): up to 427,350 sq. m
- (including 100,844 sq. m for DHL Supply Chain that is also the subject of Application Reference 15/00919/FUL that was submitted in June 2015)
- Logistics Institute of Technology (Use Class D1): up to 3,700 sq. m together with its campus
- Estate office, with heritage exhibition centre and conference facility (Use Class D1): up to 300 sq. m.
- Holovis expansion building (Use Class B1a, B1b): up to 7,000 sq. m
- Innovation Centre: up to 2,325 sq. m.
- Public park and meadowland: c 70 ha
- Access corridor, structural landscaping, SUDs systems
- Demolition of existing buildings on the site



Zone 2 (detailed):

- Railfreight shuttle terminal
- HGV Parking (140 spaces)
- HGV Driver Training Centre
- LPG or GNP Fuel Island and Vehicle washing facility.

1.2.3 Zone 1 already benefits from planning consent to provide an area for HGV and car parking.

1.2.4 *IDI Gazeley* will be seeking planning permission for each parcel and its parameters, the means of access and the details of the railfreight shuttle. The demolition of Bittesby House at the centre of the site is required to facilitate the development of the distribution warehousing.

1.2.5 The Parameter Plan covers every part of the site and is provided in Appendix B of the Environmental Statement. It specifically identifies the siting and extent of each development parcel, the use of each parcel, and for parcels with buildings, the maximum quanta and heights. Detailed planning permission is to be sought for the railfreight shuttle terminal.

1.3 Site Description

The Application Site

1.3.1 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 Environmental Impact Assessment. The red and blue line site boundary plans are presented in Appendix B of the EIA.

1.3.2 Zone 1, is a circa 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.

1.3.3 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.

The Site – Zone 1

1.3.4 Zone 1 is linked to and extends Magna Park. Its boundaries are created by the A5 to the south and west, Mere Lane to the east and the ridgeline hedgerows following the parish boundary to the north.

1.3.5 The village is Willey which is 0.85 km away to the west of the nearest point of the proposed extension, beyond the A5. To the north are the villages of Ullesthorpe and Claybrooke Parva



which are located, at the closest point from the Site, 1.0 km and 1.3 km distant. Bitteswell is located 2.0 km to the east of the Site and the market town of Lutterworth is located 2.2 km to the east.

- 1.3.6 Access to Zone 1 is currently provided by Mere Lane, which in turn connects to the A5 and the wider strategic highway network. Junction 20 of the M1 is located beyond Lutterworth, approximately 4.5 km to the east of the Site. Further afield, Junction 1 of the M69 and Junction 1 of the M6 are situated to the north west and south west respectively. Bittesby Farm, the Brick Barn (occupied by Holovis) and Bittesby House, all located within Zone 1, are connected to Mere Lane by two minor access roads.
- 1.3.7 Zone 1 comprises large open arable fields, smaller enclosed fields, some mature hedgerow boundaries and mixed native tree belts. Zone 1 slopes away from the high ground of its boundaries towards the Upper Soar Valley that crosses the centre of the site. The vertical level difference changes by more than 20 m across the site from highest ground along the eastern Mere Lane and the northern boundary at circa 125m AOD, to the lowest point of 103m AOD in the valley bottom. From this central valley, the ground rises gently again towards White House Farm at the north western corner of Zone 1. Two smaller tributary streams meet the Upper Soar and run along small valleys to the east of Zone 1. To the west, two small folds in the landscape also carry ditches towards the main valley bottom.
- 1.3.8 Public Rights of Way Bridleways and Public Footpaths cross the site connecting the village of Willey to Ullesthorpe and Claybrooke Parva and the Lutterworth Road. These rights of way intersect and connect with the permissible routes that currently allow a variety of walking and riding itineraries around the site.
- 1.3.9 Included within the application boundary are the Magna Park services farm and its associated amenity pond and reed beds and existing areas of grassland and plantation woodland.
- 1.3.10 Further north, parts of three further arable fields are included within the Zone 1 area, up to the ridge line which is marked by a bridleway. To the north west, the red line boundary of the site also includes a 20 m wide strip of arable land proposed for offsite tree planting. The strip lies alongside an existing hedgerow and continues across an arable field to meet the existing ridgeline hedgerow that forms the Ullesthorpe Parish boundary.
- 1.3.11 Zone 1 of the Site also contains the Scheduled Monument of Bittesby Deserted Medieval Village (reference 1012563). The Village is recorded in the Domesday Survey (1086 AD) and is likely to have been established in the late Saxon period. The Scheduled Monument is located at the centre of the site between the railway embankment and Upper Soar tributary. This open access land comprises visible earthworks maintained by sheep grazing.
- 1.3.12 No development is proposed for the Scheduled Monument. Geophysical and fieldwalking surveys of the accessible areas within Zone 1 have been carried out in support of the current application. There is evidence of archaeological assets to the north east and east of the Scheduled Monument which contribute to the significance and setting of the Monument. These heritage assets will be removed from cultivation and will be preserved in situ in the design proposals. Geophysical anomalies of archaeological interest have been identified



elsewhere in Zone 1, mainly along the A5; however, they will not prohibit development. These assets will be assessed through trial trenching in advance of the application.

1.3.13 Bittesby House, Bittesby Cottages and the former 'lodge' to Bittesby House represent the three non-designated heritage assets located in Zone 1. Bittesby House, formerly a farmhouse and now used as office space, dates from at least the 18th century. Bittesby Cottages, lying to the north-east of Bittesby House, date from the late 19th century. The former 'lodge' to Bittesby House also dates from the late 19th century, and lies to the south-west of Bittesby House.

1.3.14 Where residences are concerned, a number of locations have been identified and agreed upon with Peter Gibson (Environmental Health Officer at Harborough District Council)¹ as representing the most exposed noise sensitive receptors. These locations are shown on the attached Figure D.1/SP1 and identified in the following table:

Ref	Description	Approx. distance and direction from site
AP1	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

T1 Zone 1 Residential Receptors

1.3.15 AP1 is now not being considered, as these cottages are part of the development site and will be demolished.

1.3.16 It is not considered necessary to identify any further residential receptors for assessment of Zone 1, as potential effects at other more distant receptors will be less than those at the identified most exposed receptors shown in the table above. For example, effects in Ullesthorpe village will be less than those assessed at AP3 (Lodge Farm Houses), due to the larger separating distance from the proposed development site in the case of Ullesthorpe.

1.3.17 Similarly noise sensitive receptors identified for Zone 2, as set out in table T2 below, are of such a distance, and screened by the existing Magna Park, that noise effects from Zone 1 development would be much less than that assessed to AP2 (Springfield Farmhouse).

1.3.18 Due account will also need to be taken of the noise environment at the scheduled ancient monument. The schedule entry states that although partly disturbed, the deserted medieval village at Bittesby contains earthworks in good condition and retains high archaeological potential. However the monument does not appear to be prized for its tranquillity and it does not appear to attract significant numbers of visitors from the general public. This type of

¹ Confirmed by Mr Gibson by email on 8 September 2015



location would not be considered to be of the same sensitivity as a residential external amenity area, such as a garden space. However, the noise levels at this location due to the proposed units are considered in the context of the existing noise climate at the monument and set out within this report as assessment position AP0.

The Site: Zone 2

- 1.3.19 Zone 2 forms part of the developed southern edge of Magna Park. Immediately to the zone's north, is a distribution building occupied by Pearson (Plot 7100) and the George House office building. Zone 2 is located approximately 1.6 km from Willey to the north west, 1.6 km from Lutterworth to the east and 2.5 km from Cotesbach to the south east. Access to Zone 2 is via the southern arm of the roundabout on Coventry Road (the A4303), which to the north also provides the main point of vehicular access to Magna Park.
- 1.3.20 Zone 2 benefits from an extant planning permission for a HGV parking facility which was granted by HDC in November 2012 (reference 12/00851/FUL: Change of use of land to provide HGV and car parking; formation of hard standing; erection of vehicle maintenance unit building, administration building, fuel island and vehicle washing facility, associated landscaping (revised scheme of 11/01757/FUL), Land South Of And Adjacent To Asda George Headquarters, A4303, Magna Park, Lutterworth). *IDI Gazeley* is in the process of discharging the pre-commencement conditions relating to the approved HGV parking scheme and will begin the development once the requisite approvals have been secured. The existing arrangements for both the main Magna Park access point and Zone 2 access will benefit from improvements and upgrading works associated with the proposed DHL Supply Chain project, currently subject of a planning application (15/00919/FUL) and the extant planning permission for the HGV parking facility.
- 1.3.21 Zone 2 consists of two fields, neither of which are currently in agricultural use. Zone 2 slopes from the north to the south, with an overall fall of some 12 metres. Some existing mature trees and hedgerows are located on the northern and southern edges of the zone and there is an existing hedgerow running through it from north to south. A brook runs adjacent to the southern boundary. Beyond Zone 2 to the south and east is open farmland.
- 1.3.22 Zone 2 does not accommodate any designated or non-designated heritage assets. However, a programme of archaeological work based upon a Written Scheme of Investigation will shortly be undertaken, in accordance with Condition 20 of the extant planning permission.
- 1.3.23 There are no Public Rights of Way Bridleways or Public Footpaths crossing or abutting Zone 2.
- 1.3.24 Where residences are concerned, a number of locations have been identified and agreed upon with Peter Gibson (Environmental Health Officer at Harborough District Council)² as representing the closest noise sensitive receptors. These locations are shown on the attached Figure D.1/SP1 and identified in the following table:

² Confirmed by Mr Gibson by email on 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

T2 Zone 2 Residential Receptors

- 1.3.25 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 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.
- 1.3.26 Similarly noise sensitive receptors identified for Zone 1, as set out in table T1 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.

2 Operational Noise Assessment Methodology

2.1 Assessment Locations

- 2.1.1 Seven assessment positions have been selected, comprising the relevant assessment locations set out above in table T1 and T2 and the scheduled ancient monument, as indicated on attached figure Figure D.1/SP1 as set out below:

Zone 1 Assessment Positions

- AP2 – Springfields Farmhouse
- AP3 – Lodge Farm House
- AP4 – Residences off A5 at White House Farmhouse
- AP0 – Scheduled ancient monument

Zone 2 Assessment Positions

- AP5 – Cross In Hand Farmhouse
- AP6 – Liberty's Hotel
- AP7 – Moorbarns Farm

- 2.1.2 As noted above, Emmanuel and Lodge cottages at assessment position AP1, as originally agreed with Harborough District Council EHO Peter Gibson, will no longer be residential during construction or operation of this development, being planned for demolition as part of the



works. Therefore this position is not considered as part of the noise impact assessment for this site.

- 2.1.3 Assessment positions AP2 to AP4 are representative of the closest residences to the proposed Zone 1 development site. Assessment positions AP5 to AP7 are representative of the closest residences to the proposed Zone 2 development site. Due to distance propagation and screening, noise levels from operational activities at more distant noise sensitive locations would be expected to be lower than at the assessed locations.
- 2.1.4 To all residential assessment positions, where relevant, the assessment is undertaken to ground floor and first floor to ensure any potential mitigation provides suitable protection to all levels at the most exposed facade.
- 2.1.5 To the scheduled ancient monument, the assessment is undertaken at a position 1.5m above the local ground level at locations representative of the monitoring positions ST4 to ST6 across the monument as set out in Appendix D.2A. The noise levels detailed within this report are based on the highest calculated levels at each of these locations under each scenario and index.

2.2 Methodology

- 2.2.1 Assessment of noise from the operation of the logistics facility is carried out on the basis set out in Appendix D.3. This methodology represents a robust way of assessing the potential noise impact of developments such as this and has been agreed with Harborough District Council EHO Peter Gibson³.
- 2.2.2 The methodology involves a comparison of calculated total $L_{Aeq, 1 \text{ hour}}$ during the day and $L_{Aeq, 15 \text{ minutes}}$ rating noise levels at night with the existing background noise levels. This is undertaken over the full period during which the proposed facility is expected to operate. In this case this is proposed to be 24 hours a day, 7 days a week.
- 2.2.3 As described in Appendix D.3, daytime and night time rating levels of 45 dB $L_{Ar, 1 \text{ hour}}$ and 40 dB $L_{Ar, 15 \text{ minutes}}$ respectively are considered absolute thresholds. Where the assessment indicates a noise rating level equal to or lower than these thresholds during the relevant period, no further action is deemed necessary.
- 2.2.4 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 table T2 of Appendix D.3, such that there is no need to reduce levels below the absolute thresholds of 45 and 40 dB for the day and night periods respectively, even if the BS 4142 comparative assessment indicates

³ Confirmed by Mr Gibson by email on 8 September 2015



otherwise. Above these threshold levels, the criteria are set relative to the existing background noise climate in accordance with table T3 of Appendix D.3.

- 2.2.5 Regarding the scheduled ancient monument, although the WHO guidelines for environmental noise target level of 55 dB $L_{Aeq, 16 \text{ hour}}$ for residential external amenity areas does not apply, it is considered to be an aspirational design target.
- 2.2.6 However, due to the reduced sensitivity of this location when compared to a residential receptor, it is not considered appropriate to set this as a fixed limit. Where practicable, operational noise levels from the units would be controlled to this level over a 1-hour averaging period. If limiting of noise levels to 55 dB $L_{Aeq, 1 \text{ hour}}$ or lower is not practicable, it would instead be aimed to reduce the noise levels at this location as much as possible. This is in fact in line with guidance for residential amenity as set out in paragraph 7.7.3.2 of BS 8233:2014 (Guidance on sound insulation and noise reduction for buildings), which recognises the fact that such noise levels are not achievable in all circumstances where development might be desirable.
- 2.2.7 As can be seen from the attached Appendix D.2A, the existing noise levels under prevailing wind conditions (wind from the south west quadrant) were typically in the region of 50 dB L_{Aeq} . Under less common conditions of north easterly wind direction, i.e. blowing towards the A5 from the monument, existing ambient noise levels are lower. However these conditions occur for a minority of the year and it is therefore considered appropriate in the case of the scheduled monument to aspire to the target of 55 dB $L_{Aeq, 1 \text{ hour}}$ which relates to the most common wind conditions.
- 2.2.8 Maximum noise levels (L_{Amax}) shall be limited to 57 dB(A) or, where existing free field L_{Amax} levels are higher than this level, limited to within the existing typical L_{Amax} range.
- 2.2.9 Noise levels due to reversing sounders, including any applicable penalties for this specific noise source as detailed in Appendix D.3, shall be limited to 57 dB L_{Amax} .

2.3 Mechanical Services Noise Limits

- 2.3.1 An assessment of the plant noise should be undertaken in accordance with BS4142:2014. If the noise emitted has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and/or distinct impulse (bangs, clicks, clatters, thumps), then an appropriate penalty should be added to the relevant plant noise rating level in accordance with the standard.
- 2.3.2 In order to ensure that the cumulative operational activities and plant noise rating level does not exceed acceptable levels it is proposed that more onerous limits are applied to plant noise than operational noise. This is due to plant noise being more easily controlled through appropriate placement and mitigation of mechanical services plant items.
- 2.3.3 Therefore it is proposed that plant noise limits are set at 10 dB below the operational noise limits for the development. This will ensure that the overall noise from the development is not elevated by plant noise.



3 Noise Survey Results

3.1 Baseline Noise Climate

- 3.1.1 The baseline noise climate was established through an environmental noise survey as set out in detail in the attached Appendix D.2A and Appendix D.2B. In summary it was found that noise levels across the site at Zones 1 and 2 were dominated by road traffic on the A5 road, with some contribution from the existing Magna Park development at locations closer to this.
- 3.1.2 As described in Appendix D.2A it was apparent from the monitoring periods that the wind direction has a significant bearing on noise levels across the site due to the A5 roadway 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 from the south west quadrant than when it was from the north east quadrant.
- 3.1.3 It is considered appropriate to take the current baseline as representative of the future baseline in a 'no development' scenario. Therefore any impacts, and their associated magnitude, identified as part of the operational noise assessment are expected to be representative of the impacts when considered relative to a future 'no development' scenario. This is very much a worst case approach as the general network growth, associated in particular with a major transport infrastructure link such as the A5, would be expected to effect the existing baseline levels.

3.2 Zone 1 Monitoring Results

- 3.2.1 The following table T3 sets out a summary of the resultant baseline noise levels at each of the assessment positions for Zone 1 against which the assessments should be undertaken. The table also sets out the measurement position from the survey which is used to establish the baseline noise level for each assessment position. The assessment locations are reproduced below, and can be seen on the attached site plan Figure D.1/SP1.
- AP2 – Springfields Farmhouse
 - AP3 – Lodge Farm House
 - AP4 – Residences off A5 at White House Farmhouse
 - AP0 – Scheduled ancient monument



Assessment Position	AP2	AP3	AP4	AP0
Equivalent Measurement Position	LT3	LT1	LT2	ST4-ST6
$L_{Aeq, 16 \text{ hour}}$ Day Time (dB)	43	40	53	37-51
$L_{Aeq, 8 \text{ hour}}$ Night Time (dB)	41	36	49	N/A
$L_{A10, 18 \text{ hour}}$ Day Time (dB)	44	40	56	N/A
$L_{A90, 1 \text{ hour}}$ Day	35	30	43	47
$L_{A90, 15 \text{ minutes}}$ Night	30	28	29	N/A
$L_{Amax,F}$ Night Range	45-78	34-68	53-87	N/A
$L_{Amax,F}$ Night Average	54	46	62	N/A

T3 Week day and night time free-field baseline noise levels at Zone 1 assessment positions

Assessment Position	AP2	AP3	AP4	AP0
Equivalent Measurement Position	LT3	LT1	LT2	ST4-ST6
$L_{Aeq, 16 \text{ hour}}$ Day Time (dB)	44	39	52	37-51 ^A
$L_{Aeq, 8 \text{ hour}}$ Night Time (dB)	40	34	48	N/A
$L_{A10, 18 \text{ hour}}$ Day Time (dB)	44	39	55	N/A
$L_{A90, 1 \text{ hour}}$ Day	36	32	43	47 ^A
$L_{A90, 15 \text{ minutes}}$ Night	29	28	32	N/A
$L_{Amax,F}$ Night Range	43-79	32-65	53-81	N/A
$L_{Amax,F}$ Night Average	53	45	62	N/A

T4 Weekend day and night time free-field baseline noise levels at Zone 1 assessment positions

^A – Although monitoring was undertaken during weekdays only, weekend levels at AP0 are detailed as being equivalent to weekday levels based on the similarities between weekend and weekday levels at AP2 to AP4.



3.3 Zone 1 Operational Noise Limits

- 3.3.1 As set out in attached Appendix D.3, where assessment indicates noise rating levels at or below 45 dB and 40 dB $L_{Ar, Tr}$ during the day and night respectively no further action is necessary. These thresholds are equivalent to the Lowest Observed Adverse Effect Level for each of the day and night periods when background sound levels are low. Where background sound levels are higher, the LOAEL is dependent upon on the existing background sound level, in accordance with BS 4142.
- 3.3.2 The following table T5 sets out the effective Lowest Observed Adverse Effect Level applicable to each assessment position, in line with this approach.

Location	LOAEL Threshold, $L_{Ar,Tr}$ dB(A)	
	Daytime (07:00-23:00h)	Daytime (07:00-23:00h)
AP2 - Springfields Farmhouse	45	40
AP3 - Lodge Farm Houses	45	40
AP4 - Residences off A5 at White Farm	48	40

T5 Lowest Observed Adverse Effect Levels for operational noise from the development at Zone 1

- 3.3.3 If these levels are exceeded, the aim is then to mitigate and reduce to a minimum the noise levels resulting from the proposed operation.
- 3.3.4 The operational noise aspirational target at the scheduled ancient monument, AP0, is 55 dB $L_{Aeq, 1 \text{ hour}}$ and applies during daytime hours only as set out in paragraph 2.2.8 above.
- 3.3.5 The aim is to limit maximum noise levels (L_{Amax}) to 57 dB at all residential assessment positions, as typical existing night time L_{Amax} levels fall below this absolute limit at each of the positions. Noise levels due to reversing sounders, including any relevant penalties for this type of noise source, should not exceed 57 dB L_{Amax} .

3.4 Zone 2 Monitoring Results

- 3.4.1 The following table T6 sets out a summary of the resultant baseline noise levels at each of the assessment positions for Zone 2 against which the assessments should be undertaken. The table also sets out the measurement position from the survey which is used to establish the baseline noise level for each assessment position. The assessment locations are reproduced below, and can be seen on the attached site plan Figure D.1/SP1.



- AP5 – Cross In Hand Farmhouse, 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.

Noise Indices, dB	MP1	MP2 ⁱ	AP5 ⁱⁱ	AP6 ⁱⁱⁱ	AP7 ⁱⁱⁱ
$L_{Aeq,16h}$ Day Time	63	70	70	52	44
$L_{Aeq,8h}$ Night Time	60	66	66	48	40
$L_{A90,15min}$ Day Time	47	49	49	36	<30
$L_{A90,15min}$ Night Time	38	40	40	<30	<30
$L_{Amax,F}$ Night Range	69-78	69-78	N/A	N/A	N/A
$L_{Amax,F}$ Night Average	72	72	N/A	N/A	N/A

T6 Typical measured day and night time free-field noise levels at Zone 2 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

3.5 Zone 2 Operational Noise Limits

- 3.5.1 A set out in the attached Appendix D.3, where assessment indicates noise rating levels at or below 45 dB and 40 dB $L_{Ar, Tr}$ during the day and night respectively no further action is necessary. These thresholds are equivalent to the Lowest Observed Adverse Effect Level for each of the day and night periods when background sound levels are low. Where background sound levels are higher, the LOAEL is dependent upon on the existing background sound level, in accordance with BS 4142.
- 3.5.2 The following table T7 sets out the effective Lowest Observed Adverse Effect Level applicable to each assessment position, in line with this approach.



Location	LOAEL Threshold, $L_{Ar,Tr}$ dB(A)	
	Daytime (07:00-23:00h)	Daytime (07:00-23:00h)
AP5 – Cross In Hand Farmhouse	54	45
AP6 – Liberty’s Hotel	45	40
AP7 – Moorbarns Farm	45	40



T7 Lowest Observed Adverse Effect Levels for operational noise from the Zone 2 development

- 3.5.3 If these levels are exceeded, the aim is then to mitigate and reduce to a minimum where practicable the noise levels resulting from the proposed operation.
- 3.5.4 The aim where maximum noise levels (L_{Amax}) are concerned shall be to limit them to 57 dB at all residential assessment positions, or equivalent to typical existing night time L_{Amax} levels where these exceed the 57 dB limit already. Noise levels due to reversing sounders, including any relevant penalties for this type of noise source, should not exceed 57 dB L_{Amax} .

3.6 Plant Noise Limits

- 3.6.1 Plant noise limits have been set based on the commentary in Section 2.3 above at 10 dB below the equivalent operational noise limit. These limits apply to the combined effect of all mechanical services plant items to be installed as part of the development and are shown in the table below:



Location	Mechanical Services Noise levels, dB(A)	
	Daytime (07:00-23:00 only)	Night time (23:00-07:00 only)
AP2 - Springfields Farmhouse	35	30
AP3 - Lodge Farm Houses	35	30
AP4 - Residences off A5 at White Farm	38	30
AP5 – Cross In Hand Farmhouse	44	35
AP6 – Liberty’s Hotel	35	30
AP7 – Moorbarns Farm	35	30



T8 Mechanical services plant noise limits at the nearest residential properties



4 Zone 1 Operational Noise Impact Assessment

4.1 Overview

4.1.1 In order to demonstrate that the noise criteria shown in section 3.3 above can be achieved, a noise impact assessment has been conducted based on our understanding of the use of the Magna Park Extension Outline Application site at Zone 1.

4.1.2 As part of this assessment we have been informed that tugs will be used on site and that all HGVs to Units G, H1, I, J and L will be ambient, i.e. no chilled HGVs will use this site. It is understood that chilled HGVs will be in use at Units H2, K1 and K2 with electrical hook-up points provided to all necessary bays and parking spaces such that diesel generators are not required to service stationary vehicles on site.

4.2 Traffic Flow

4.2.1 The number of HGVs and cars accessing and leaving the total site on an hourly basis has been provided by AECOM and are set out in the attached activity schedule, Schedule D.1/SCH2. The traffic flows include traffic serving both Zone 1 and Zone 2 and so the traffic assessment is applicable to the overall Hybrid Application site.

4.2.2 The flows have been divided between all units on the basis that Units G, H1, H2, and I will be served from the southerly access point, while Units J, K1, K2, and L will be served from the northern access point. Specific flows were provided for Unit G under detailed application 15/00919/FUL for Magna Park Extension: DHL Supply Chain. These flows have been used for Unit G, the remaining flows for the southern access have been applied to Units H1, H2, and I, while the northern access point flows have been applied to Units J, K1, K2, and L.

4.2.3 It is considered appropriate to assume that the operational noise for the site will be sufficiently uniform such that the 15 minute rating level will equate to the 1 hour rating level. The assessment and associated results output are prepared on this basis.

4.3 Noise Rating Levels

4.3.1 In order to calculate the noise rating level at the receiver position it is necessary to assess any acoustic characteristics present in the noise source compared to the existing noise climate and if any penalties should be applied to the noise source in order to take this into account.

4.3.2 BS 4142:2014 provides the following guidance for subjectively applying penalty corrections to noise sources:

“Tonality

For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.



Impulsivity

A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible.

Other sound characteristics

Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

NOTE 2 Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant then it might be appropriate to apply a single correction. Where both features are likely to affect perception and response, the corrections ought normally to be added in a linear fashion.

Intermittency

When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. This can necessitate measuring the specific sound over a number of shorter sampling periods that are in combination less than the reference time interval in total, and then calculating the specific sound level for the reference time interval allowing for time when the specific sound is not present. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied. "

- 4.3.3 Attached Schedule D.1/SCH1 shows the acoustic character penalty added to each noise source within the acoustic model.
- 4.3.4 It is important to note that this character is dependent on the existing noise climate. For example the existing noise climate is dominated by road traffic on the A5. Therefore no character corrections are deemed necessary for HGV and car movements to the units as the current noise climate already contains noise sources of this type.
- 4.3.5 Similarly, given the proximity of the existing Magna Park to AP1 and AP3, the general operational noise from the proposed development is similar in character to that of the existing noise climate at these locations. However character corrections as set out in the attached Schedule D.1/SCH1 have been applied to the operational noise levels in order to provide a pessimistic and robust representation of the impact.

4.4 **Acoustic Model**

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



assessment positions, generated by the onsite HGV movements and activities. Sound propagation is calculated taking account of factors such as divergence, screening and ground absorption. Moderate downwind conditions are assumed, which represents a reasonable worst case because it means that in the model there is effectively a light wind from source to receiver *in every case*. Clearly this is not possible in reality.

- 4.4.2 It should be noted that the assessment has been conducted at the assessment positions under free field conditions, for direct comparison with the measured and derived free field noise levels.
- 4.4.3 The model has been based upon electronic drawings showing the area around the site, as well as the proposed site layout. The landform in the computer model has been based upon elevation information from the topographical survey map covering the site. It therefore takes into account significant variation in topography across the site but not very localised variations.
- 4.4.4 The noise sources have been defined based upon archive measurement data, as set out in attached Schedule D.1/SCH1.
- 4.4.5 For the purposes of the model, a single unit of activity has been defined as set out in attached Schedule D.1/SCH3. To summarise, a single unit of activity is defined as a complete HGV arrival, loading/unloading and departure cycle, whereby one HGV enters the site and parks, a tug drives to the parking space the trailer is decoupled, hitched to the tug and driven to the loading bay to be unloaded or loaded. The tug then returns the trailer to the parking space, recouples to the HGV. One HGV starts up and leaves the site, all within the same hour.
- 4.4.6 A number of assumptions have been made to build a consistent acoustic model as follows:
- The activities described in Schedule D.1/SCH3 are assumed to be evenly distributed across the parking spaces, in proportion to the number of spaces for the two types of vehicle (car and HGV).
 - The total movements have been divided among the units using a ratio equivalent to the number of loading bays for HGVs and the number of parking spaces for staff cars.
 - No refrigerated HGV's would be present on site at any time for Units G, H1, I, J, or L. All HGV's serving Units H2, K1, and K2 are assumed to be refrigerated with high level (in terms of position) diesel fridge packs running when the vehicles are in motion but connected to electrical hook-ups when static on site.
 - All trailers are serviced by tugs except for Unit G at which it has been confirmed there will be no tugs.
- 4.4.7 The validity of these assumptions has been confirmed by the developer. Should any changes or variations to the assumptions listed above be considered necessary at any stage then the operational noise impact assessment may need to be revised accordingly.



4.5 Initial Model Results

- 4.5.1 The resultant noise levels at the assessment position for the operations detailed above and vehicle movements detailed in Schedule D.1/SCH2 have been calculated and are shown in Schedule D.1/SCH4.
- 4.5.2 For each assessment position, the resultant noise levels have been calculated at both ground floor and first floor facades where appropriate. The results set out in the attached Schedule D.1/SCH4 provide a single level for each façade location in each assessment period, 1 hour between 07:00h and 23:00h and 15 minutes between 23:00h and 07:00h. This single level is the higher of the ground and first floor calculated level at all relevant facades at each assessment position in each assessment period.
- 4.5.3 The schedule shows that the predicted noise levels are below the Lowest Observable Adverse Effect Level (LOAEL) threshold during the day time at all assessment positions and so are considered to be within or below the Lowest Observable Adverse Effect Level (LOAEL) range as detailed in section 2.2 above.
- 4.5.4 The predicted noise levels fall below the LOAEL threshold of 40 dB $L_{Ar, 15 \text{ minutes}}$ during the night at all times and positions except for between 05:00h and 07:00h at AP4, White House Farm. During this time the threshold is exceeded by less than 1 dB, indicating that the impact just falls in to the Observed Adverse Effect level range.
- 4.5.5 The predicted operational noise levels at the Scheduled Monument are below 50 dB $L_{Ar, 1 \text{ hour}}$ in each hour and equivalent to a daytime index of 47 dB $L_{Ar, 16 \text{ hour}}$. This is below the aspirational target of 55 dB $L_{Aeq, 16 \text{ hour}}$ and therefore is considered acceptable.

4.6 Mitigation

- 4.6.1 The proposed units have been located such that screening is provided from the majority of activity noise sources to the most exposed noise sensitive premises by means of the buildings themselves.
- 4.6.2 The calculations indicate that the introduction of a 4m high acoustic screen along the north west access road, as shown in the attached Figure D.1/F1, would reduce noise levels to below the LOAEL threshold at all times. Such a screen would need to be constructed using a material with mass per unit area of 10 kg/m² or greater, timber acoustic fencing, and would run to a height of 4m above the nearest highest carriageway point.
- 4.6.3 This assessment indicates that with acoustic screening in place that the outline application site at Zone 1 can comply with the stated criteria. The exact extents of such screening, along with a cumulative assessment considering the benefits of such screening along with visual and safety aspects should be reviewed during detailed design and application for the sites.
- 4.6.4 A document outlining recommended noise management plan principles has been attached under Plan D.1/NM1. This sets out operational controls which can be put in place to further



limit any noise emissions from the site. It is recommended that these principles are applied where practicable.

- 4.6.5 The results set out in the attached Schedule D.1/SCH4 set out the noise levels calculated under the 'Screened' scenario, where the above 4m high acoustic screen is in place.

5 Zone 2 Operational Noise Impact Assessment

5.1 Overview

- 5.1.1 In order to demonstrate that the noise criteria shown in section 3.3 above can be achieved, a noise impact assessment has been conducted based on our understanding of the use of the Magna Park Extension Outline Application site at Zone 2.
- 5.1.2 As part of this assessment we have been informed that only a small number, if any, of the vehicles serving this yard will have refrigerated containers. We have been advised that 10% of vehicles would be a very worst case likely scenario and so a ratio of 9:1 ambient to refrigerated vehicles has been used.
- 5.1.3 We have been advised that maximum daily numbers are likely to be 34 containers with containers being moved onwards on a daily basis. This relates to 34 shuttle movements (one arrival and one departure per movement) and 34 tug movements (one arrival and one departure per movement) per day, with a total of 136 container movements per day.
- 5.1.4 The hourly profile across a 24-hour day for these 34 container movements has been based on the traffic flows provided by the transport consultant for the southern access to the Zone 1 and Zone 2 sites. The hourly movements used for the model are set out in the attached Schedule D.1/SCH2. For a worst case scenario it was taken that each of the 16 staff car parking spaces were used, with an associated car arrival and departure, in each hour. This is a pessimistic scenario, and unlikely to happen in practice, but gives a worst case basis for the car movements associated with the centre.
- 5.1.5 The assessment has been undertaken on the above basis.

5.2 Noise Rating Levels

- 5.2.1 In order to calculate the noise rating level at the receiver position it is necessary to assess any acoustic characteristics present in the noise source compared to the existing noise climate and if any penalties should be applied to the noise source in order to take this into account. Descriptions of the relevant characteristics are given above in section 4.3.
- 5.2.2 Attached Schedule D.1/SCH1 shows the acoustic character penalty added to each noise source within the acoustic model.
- 5.2.3 It is important to note that this character is dependent on the existing noise climate. For example the existing noise climate is dominated by road traffic on the A5. Therefore no



character corrections are deemed necessary for Shuttle and Tug movements to the units as the current noise climate already contains noise sources of this type.

- 5.2.4 Similarly, given the proximity of the existing Magna Park to AP5, the general operational noise from the proposed development is similar in character to that of the existing noise climate at these locations. However character corrections as set out in the attached Schedule D.1/SCH1 have been applied to the operational noise levels in order to provide a robust representation of the impact.

5.3 Acoustic Model

- 5.3.1 An acoustic model has been created using a computer based noise prediction program (Wölfel IMMI version 2014). This has been used to determine the free field noise levels, at the assessment positions, generated by the onsite movements and activities. Sound propagation is calculated taking account of factors such as divergence, screening and ground absorption. Moderate downwind conditions are assumed, which represents a reasonable worst case because it means that in the model there is effectively a light wind from source to receiver *in every case*. Clearly this is not possible in reality but is considered to give a worst case representation.
- 5.3.2 It should be noted that the assessment has been conducted at the assessment positions under free field conditions, for direct comparison with the measured and derived free field noise levels.
- 5.3.3 The model has been based upon electronic drawings showing the area around the site, as well as the proposed site layout.
- 5.3.4 The noise sources have been defined based upon archive measurement data, as set out in attached Schedule D.1/SCH1.
- 5.3.5 For the purposes of the model, a single unit of activity has been defined as set out in attached Schedule D.1/SCH3. To summarise, a single unit of activity is defined as a complete shuttle arrival and return cycle, whereby one shuttle enters the site, and parks, a tug starts up and moves from the parking space to the docking area, loads or unloads and exits the site *and* one shuttle starts up and leaves the site, all within the same hour.
- 5.3.6 A number of assumptions have been made to build a consistent acoustic model as follows:
- The activities described in Schedule D.1/SCH3 are assumed to be evenly distributed across the parking spaces, in proportion to the number of spaces for the vehicles.
 - 10% refrigerated HGV's would be present on site at any time.
 - Tugs would be operating onsite at all times.



5.3.7 The validity of these assumptions has been confirmed by the developer. Should any changes or variations to the assumptions listed above be considered necessary at any stage then the operational noise impact assessment may need to be revised accordingly.

5.4 **Initial Model Results**

5.4.1 The resultant noise levels at the assessment position for the operations detailed above and vehicle movements detailed in Schedule D.1/SCH2 have been calculated and are shown in Schedule D.1/SCH5.

5.4.2 For each assessment position, the resultant noise levels have been calculated at both ground floor and first floor facades where appropriate. The results set out in the attached schedule provide a single level for each façade location in each assessment period – 1 hour between 07:00h and 23:00h and 15 minutes between 23:00h and 07:00h. This single level is the highest of the ground and first floor calculated level at each assessment position.

5.4.3 The schedule shows that the predicted noise levels are below the Lowest Observable Adverse Effect Level (LOAEL) threshold during the day time at all assessment positions and so are considered to be within or below the Lowest Observable Adverse Effect Level (LOAEL) range as detailed in section 2.2 above.

5.4.4 The predicted noise levels fall below the LOAEL threshold of during the night at all times and positions except for between 05:00h and 07:00h at AP6, Liberty's Hotel. During this time the threshold is exceeded by 2 dB, indicating that the impact falls into the Observed Adverse Effect level range.

5.5 **Mitigation**

5.5.1 As set out in the attached Appendix D.3, where the LOAEL threshold is exceeded the mitigation should be introduced where practicable to reduce noise levels to a minimum. If notional acoustic screening to a height of 7m were introduced along the southern boundary of the site, the LOAEL threshold could be met at all times during the day and night at all assessment positions.

5.5.2 However, such a screening height is not considered to be a practicable option as it could have adverse visual and structural implications, with wind loading issues also considered to be a potential issue.

5.5.3 The exceedance by 2 dB falls within the Observed Adverse Effect level range but would not be considered a Significant Observed Effect Level (SOAEL). Given that the LOAEL threshold is met at all positions and all times except for a two hour period at AP6, it is recommended that the development be considered suitable in its current form without the need for screening. Therefore the results as detailed above and set out in Schedule D.1/SCH5, showing levels to be at or below the LOAEL threshold at most times, remain valid for the proposed development.



6 Assessment of Noise Events of Short Duration

6.1 Criterion

- 6.1.1 Maximum noise levels (L_{Amax}) shall be limited to 57 dB(A) at assessment positions AP2 and AP3, as typical existing night time L_{Amax} levels fall below this absolute limit at each of these positions. At AP4 the average night time L_{Amax} level is 62 dB, therefore L_{Amax} levels due to noise events of short duration on site should not exceed this level.
- 6.1.2 As set out in Appendix D.3, noise levels due to reversing sounders are considered differently to other noise events of short duration, due to the nature of the noise source. The above 57 dB L_{Amax} limit will apply to noise levels from the reversing sounders, however a 12 dB penalty will be applied to the reversing sounder to reflect the inherent 'noticeable' nature of the source.
- 6.1.3 Therefore, allowing for the 12 dB penalty, the observed, or measured, noise levels due to reversing sounders, including any relevant penalties for this type of noise source, should not exceed 45 dB L_{Amax} .

6.2 Zone 1 Assessment

- 6.2.1 Calculations of night time (23:00 – 07:00h) L_{Amax} noise levels at nearby sensitive locations due to onsite activity have been undertaken on a similar basis to that described for ambient noise in section 4 above. L_{Amax} are only particularly relevant during these night time hours. However it is worth noting that as the noise characteristics associated with the site would not change between day and night time hours, the maximum L_{Amax} levels detailed for night time hours would also apply during the daytime.
- 6.2.2 All possible types of activity at all possible locations have been considered and the maximum expected L_{Amax} noise levels evaluated at the assessment positions. It must be stressed, therefore, that the results represent the absolute upper limit of L_{Amax} noise levels expected to be experienced at the assessment positions, being representative of the worst possible case activity.
- 6.2.3 It should be noted that the assessment has been undertaken under free field conditions, in line with the ambient noise assessment and the noise survey measurements.
- 6.2.4 The predicted highest L_{Amax} level at each assessment position is shown in the table below along with the typical night time range as set out above in table T3:



	Calculated and Existing L_{Amax} levels		
	AP2	AP3	AP4
Highest Operational L_{Amax}	47	49	52
Existing L_{Amax} Range (Average)	43-79 (54)	32-68 (46)	53-87 (62)



T9 Resultant Zone 1 L_{Amax} levels.

- 6.2.5 The table above shows that the calculated L_{Amax} noise levels at each assessment position are below the night time noise L_{Amax} noise criterion of 57 dB L_{Amax} as set out above. It is also important to note that the calculated highest L_{Amax} levels lie close to or below the existing typical night time L_{Amax} levels at each of the residential assessment positions.
- 6.2.6 The predicted highest L_{Amax} level at each assessment position due to reversing sounders is shown in the table below:



	Calculated Reversing Sounder L_{Amax} levels		
	AP2	AP3	AP4
Highest Reversing Sounder L_{Amax}	27	22	23



T10 Resultant Zone 1 reversing sounder levels.

- 6.2.7 The levels set out in table T10 above are given without any characteristic corrections. As can be seen, the resultant level at each assessment position is significantly below the limit, allowing for relevant penalties, of 45 dB(A).

6.3 Zone 2 Assessment

- 6.3.1 Calculations of night time (23:00 – 07:00h) L_{Amax} noise levels at nearby sensitive locations due to onsite activity have been undertaken on a similar basis to that described for ambient noise in section 4 above. L_{Amax} are only particularly relevant during these night time hours. However it is worth noting that as the noise characteristics associated with the site would not change between day and night time hours, the maximum L_{Amax} levels detailed for night time hours would also apply during the daytime.
- 6.3.2 All possible types of activity at all possible locations have been considered and the maximum expected L_{Amax} noise levels evaluated at the assessment positions. It must be stressed, therefore, that the results represent the absolute upper limit of L_{Amax} noise levels expected to be experienced at the assessment positions, being representative of the worst possible case activity.



- 6.3.3 It should be noted that the assessment has been undertaken under free field conditions, in line with the ambient noise assessment and the noise survey measurements.
- 6.3.4 The predicted highest L_{Amax} level at each assessment position is shown in the table below along with the typical night time range as set out above in table T6:

	Calculated L_{Amax} levels		
	AP5	AP6	AP7
Highest Operational L_{Amax}	54	47	38

T11 Resultant Zone 2 L_{Amax} levels.

- 6.3.5 The table above shows that the calculated L_{Amax} noise levels at each assessment position are below the night time noise L_{Amax} noise criterion of 57 dB L_{Amax} as set out above. Night time noise levels were not directly measured at AP6 and AP7. Where night time noise levels were measured, equivalent to AP5, the night time L_{Amax} range was 69 – 78 dB with an average of 72 dB L_{Amax} . The predicted maximum L_{Amax} level from the proposed Zone 2 site at AP5 is significantly below this range.
- 6.3.6 The predicted highest L_{Amax} level at each assessment position due to reversing sounders is shown in the table below:

	Calculated Reversing Beeper L_{Amax} levels		
	AP5	AP6	AP7
Highest Reversing Beeper L_{Amax}	33	32	24

T12 Resultant Zone 2 reversing sounder levels.

- 6.3.7 The levels set out in table T12 above are given without any characteristic corrections. As can be seen, the resultant level at each assessment position is significantly below the limit, allowing for relevant penalties, of 45 dB(A).

7 Road Carriageway Realignment

- 7.1 An assessment of the noise impact due to changes in road traffic associated with this development, and the cumulative noise effect due road traffic associated with this and all other committed development, has been undertaken and is detailed in the main Noise Chapter of the Environmental Statement.



- 7.2 The works will also include realignment works to the A5 roadway. These works need to be assessed accordingly.

Noise Insulation Regulations

- 7.3 The Noise Insulation Regulations 1975 (SI 1975/1763) and Amendment 1988 provide certain rights to insulation against increased traffic noise at or above a specified level from new highways for which a new carriageway has been constructed.
- 7.4 Discretionary powers to insulate against increased traffic noise at or above the specified level from altered roads are also provided.
- 7.5 In testing for eligibility for insulation the following three conditions need to be met.
- i. the combined expected maximum traffic noise level, i.e. the relevant noise level, from the new or altered highway together with other traffic in the vicinity must not be less than the specified noise level of 68 dB(A) $L_{10, 18h}$;
 - ii. the relevant noise level is at least 1.0 dB(A) more than the prevailing noise level, i.e. the total traffic noise level existing before the works to construct or improve the highway were begun;
 - iii. the contribution to the increase in the relevant noise level from the new or altered highway must be at least 1.0 dB(A).
- 7.6 To be eligible a façade must also be located within 300 metres of the limit of highway works. Only residential premises are eligible under the Regulations.
- 7.7 Eligible Buildings do not include hotels, as evidenced by a government memorandum ⁽⁴⁾ on the subject of the Noise Insulation Regulations:
- “The Regulations apply to dwellings and other buildings used for residential purposes (eg nurses’ homes, residential accommodation in schools and colleges).”*
- 7.8 It should be noted that at this stage the precise details of the proposed outline scheme have not been finalised. It is therefore not possible 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.

⁴ Memorandum to Department Of the Environment Circular 114/75 and Welsh Office Circular 196/75



Realignment at Mere Lane Junction

7.9 As part of the overall site proposals it is planned to undertake realignment works to the A5 junction with Mere Lane. The works will comprise the following, as shown on the attached Figure D.1/F1:

- Introduction of a roundabout junction between the A5 and Mere Lane
- Moving the horizontal alignment of approximately a 400m length of Mere Lane to the north west by approximately 50m
- Introduction of a roundabout junction to the access road into the proposed development
- Partial dualling of the existing single carriageway A5 in the vicinity of the roundabout

7.10 The realignment is greater than 300m from the nearest and most exposed noise sensitive receptor, being approximately 650m from the village of Willey to the west at its closest point and greater than 1.5 km from dwellings in all other directions. Therefore it is not considered necessary to undertake a noise assessment under the Noise Insulation Regulations.

7.11 Similarly, there are no dwellings on or close to the corridor where the changes will take place. Therefore it is not necessary to undertake a noise impact assessment under DMRB⁵ guidance.

7.12 In addition to the above points, it is worth noting that the noise associated with alignment changes and increases in traffic along this route due to the proposed development would be nominal when compared to noise from the existing A5 road traffic.

7.13 Therefore the impact of the Mere Lane realignment and any increases in traffic along this route associated with the development is considered to be Negligible from a noise perspective. No further consideration is therefore required for this element.

Realignment to North West of Zone 1

7.14 There will also be a roundabout introduced at the junction of the Zone 1 access road and the A5 to the north west of the site. This roundabout is approximately 250m from the White House Farmhouse. Therefore it is necessary to consider this roundabout under noise insulation regulations.

7.15 $L_{A10,18 \text{ hour}}$ levels at LT4, which is a similar distance from the A5 as this farmhouse, are 61 dB during weekends and 65 dB during weekdays. As set out in Appendix D.4, the noise levels due to increased traffic, with all committed developments considered are calculated to decrease by 0.1 dB at Year 0 or opening and increase by 2.3 dB in the worst case 15th year (design year). Under both scenarios the noise levels at White House Farmhouse would be expected to remain below 68 dB $L_{A10, 18 \text{ hour}}$ therefore noise insulation eligibility would not be triggered. However it may be necessary to re-examine this at detailed application stage depending on what is agreed at the detailed design stage.

⁵ Design Manual for Road and Bridges (DMRB) Volume 11 Section 3 Part 7 (HA 213/08) - Traffic Noise and Vibration, Highways Agency, (2011)



- 7.16 In addition to the above points, it is worth noting that the noise associated with alignment changes and increases in traffic along this route due to the proposed development would be nominal when compared to noise from the existing A5 road traffic.
- 7.17 Therefore the impact of the A5 realignment and any increases in traffic along this route associated with the development is considered to be Negligible from a noise perspective.

8 Conclusion

- 8.1 It is proposed to submit a hybrid planning application to develop land to the north west of the existing Magna Park distribution centre off the A5 near Lutterworth. The land is proposed to site a number of distribution warehouses dealt with under an outline application along with ancillary facilities such as office space and a Logistics Institute of Technology, dealt with under an outline application. In addition, a detailed application is provided for a proposed Rail Freight Shuttle Terminal.
- 8.2 This report has provided noise limits at the nearest and most exposed residential dwellings to the proposed development based on a noise survey conducted at the site along with the requirements of BS 4142:2014 and other suitable guidance. Appropriate apportionment of the noise limits have been given to noise associated with any fixed mechanical services plant such that this noise would not raise the overall operational noise of the proposed development.
- 8.3 An assessment has been conducted of noise levels generated by operations on the site and the noise levels generated by the site have been predicted at the nearest residential properties. The assessment has shown that with the currently proposed number of vehicle movements the set noise limits will be achieved at the residential properties without need for additional mitigation.
- 8.4 The assessment has demonstrated that operational noise from the proposed outline application, taking account of the mitigation inherent in the screening afforded by the buildings and an acoustic screen located to the north west of the site, would be considered to be at or below the (LOAEL). Therefore noise should not be considered a reason to impede the approval of the outline planning application. Noise levels at the Scheduled Monument of Bittesby Deserted Medieval Village have been assessed and shown to be below the aspirational maximum noise level for such a site.
- 8.5 The assessment has demonstrated that operational noise from the proposed detailed application, would be considered to be at or below the Lowest Observable Adverse Effect Level (LOAEL) at all but one assessment position over a two hour period in the morning. While mitigation through screening is not considered practicable due to the heights required, the exceedance over the LOAEL threshold is 2 dB and is limited to two hours. The exceedance does not bring the impact into the Significant Observable Adverse Effect Level, therefore noise should not be considered a reason to impede the approval of the detailed planning application.



- 8.6 The existing baseline noise levels are considered representative of those in a future 'no development' scenario. Therefore operational noise from the development when assessed against this future baseline would also be considered to be at or below the assessed impact levels.
- 8.7 Noise impacts from the proposed A5 and Mere Lane realignments have been considered and are expected to be commensurate with a noise impact of Negligible Significance, and would not be expected to trigger any eligibility for compensation under the Noise Insulation Regulations. Detailed assessment of this should however be undertaken when the sites undergo detailed application.

 End of Section

Figure D.1/SP1

Title:
Plan Showing Zone 1 and Zone 2
and Assessment Positions



Project:
Magna Park Extension: Hybrid Application

Date: September 2015 Revision: -

Scale:
Not to scale



Archive Event Noise Data

Noise Source	Height of Source (m)	$L_{Aeq,1 \text{ hour}}$ (dB) ⁱⁱ	L_{Amax} (dB) ⁱⁱⁱ	BS4142:2014 Characteristic Corrections ⁱ			
				Tonality	Impulsivity	Other	Intermittency
HGV Pass-by	1.5	60.1	86.5	0	0	0	0
Refrigerated HGV Pass-by	3.5	56.1	-				
Car pass-by	0.5	45.1	-	0	0	0	0
Tug Pass-By	1.0	56.1	-				
Pulling away from Bay - HGV	1.5	85.6	113.0	0	0	0	0
Reversing into Bay - HGV	1.5	80.6	109.0	0	0	0	0
Pulling away from Bay – Tug	1.0	75.6	100.0	0	0	0	0
Reversing into Bay – Tug	1.0	89.6	127.0	0	0	0	0
HGV Decouples	1	79.6	115.0	0	3	0	0
HGV Dock Leveller	2	92.6	120	0	3	0	0
Unloading Loading / Unloading, Containers	2	89.6	120.0	0	6	0	0
Reversing Sounder	1.5	-	98.0	-	-	-	-
Fridge Pack, 30 minutes on-time with electrical hook-up	3.5	92.6	-	3	0	0	0
Car Ignition and pull out	0.5	64.6	-	0	0	0	0



Noise Source	Height of Source (m)	$L_{Aeq,1 \text{ hour}}$ (dB) ⁱⁱ	L_{Amax} (dB) ⁱⁱⁱ	BS4142:2014 Characteristic Corrections ⁱ			
				Tonality	Impulsivity	Other	Intermittency
Door slamming, Car	0.5	56.6	-	0	3	0	0
Door Slamming, HGV	1.5	56.6	-	0	3	0	0
Container Grab from tug/shuttle and place on stack	1.5/6	97	94	0	3	0	0
Container Grab from stack and place on tug/shuttle	6/1.5	95	93	0	3	0	0
HGV Wash	2	80.6	96	0	0	0	0

ⁱ BS4142:2014 Acoustic character compared to existing background

ⁱⁱ Sound Power Level averaged over 1 hour

ⁱⁱⁱ Sound Power Level



Predicted Zone 1 Traffic Flows

Period	Arrivals		Departures		For Model ¹	
	HGV	Cars	HGV	Cars	HGV	Cars
0000-0100	6	49	11	58	11	58
0100-0200	6	47	12	34	12	47
0200-0300	6	48	13	37	13	48
0300-0400	7	54	13	41	13	54
0400-0500	9	84	13	49	13	84
0500-0600	22	237	17	63	22	237
0600-0700	19	211	25	94	25	211
0700-0800	23	202	28	114	28	202
0800-0900	23	202	28	63	28	202
0900-1000	26	126	33	45	33	126
1000-1100	27	84	35	48	35	84
1100-1200	29	77	34	47	34	77
1200-1300	28	71	34	69	34	71
1300-1400	31	134	28	81	31	134
1400-1500	30	123	26	147	30	147
1500-1600	29	77	26	157	29	157
1600-1700	28	43	26	155	28	155
1700-1800	23	66	24	141	24	141
1800-1900	15	59	25	92	25	92
1900-2000	15	42	25	43	25	43
2000-2100	11	44	17	43	17	44
2100-2200	12	95	15	49	15	95
2200-2300	13	102	15	80	15	102
2300-2400	8	56	15	91	15	91

T1 Total movements for Units G, H1, H2 and I

¹ 2 way movements (i.e. one entrance and one exit) utilised for model therefore maximum of arrival or departure used)



Predicted Zone 1 Traffic Flows

Period	Arrivals		Departures		For Model ²	
	HGV	Cars	HGV	Cars	HGV	Cars
0000-0100	6	53	12	63	12	63
0100-0200	6	51	13	37	13	51
0200-0300	7	52	14	40	14	52
0300-0400	7	58	14	44	14	58
0400-0500	10	92	14	53	14	92
0500-0600	23	256	18	68	23	256
0600-0700	21	228	27	102	27	228
0700-0800	24	219	30	123	30	219
0800-0900	25	219	30	68	30	219
0900-1000	28	137	36	49	36	137
1000-1100	29	91	38	52	38	91
1100-1200	31	83	36	51	36	83
1200-1300	30	77	37	74	37	77
1300-1400	34	145	31	88	34	145
1400-1500	33	134	29	159	33	159
1500-1600	32	84	28	170	32	170
1600-1700	30	47	28	168	30	168
1700-1800	25	72	26	153	26	153
1800-1900	16	64	27	99	27	99
1900-2000	16	46	27	47	27	47
2000-2100	12	47	19	47	19	47
2100-2200	13	103	16	53	16	103
2200-2300	14	110	16	87	16	110
2300-2400	9	60	16	99	16	99

T2 Total movements for Units J, K1, K2, and L

² 2 way movements (i.e. one entrance and one exit) utilised for model therefore maximum of arrival or departure used)



Expected Zone 1 Traffic Flows used in Model

Period	Hourly Movements G ³		Hourly Movements H ³		Hourly Movements H2 ³	
	HGV	Cars	HGV	Cars	HGV	Cars
0000-0100	6	28	3	10	2	11
0100-0200	6	23	4	8	2	9
0200-0300	6	23	4	8	3	10
0300-0400	6	26	4	9	3	11
0400-0500	6	41	4	13	3	16
0500-0600	11	115	6	37	4	45
0600-0700	12	103	7	33	5	40
0700-0800	14	98	8	32	5	38
0800-0900	14	99	8	31	5	38
0900-1000	16	62	9	20	6	24
1000-1100	17	41	10	13	6	16
1100-1200	16	37	10	13	6	15
1200-1300	16	35	10	11	6	14
1300-1400	15	65	9	21	5	26
1400-1500	15	71	8	23	5	28
1500-1600	14	77	8	25	5	30
1600-1700	14	75	8	25	5	30
1700-1800	12	69	7	22	4	27
1800-1900	12	45	7	15	5	18
1900-2000	12	21	7	7	5	8
2000-2100	8	21	5	7	3	9
2100-2200	7	46	5	15	3	18
2200-2300	7	50	5	16	3	19
2300-2400	7	44	5	15	3	18

T3 Movements for Unit G, H1 and H2

³ 2 way movements (i.e. one entrance and one exit) utilised for model therefore maximum of arrival or departure used)



Expected Zone 1 Traffic Flows used in Model

Period	Hourly Movements I ⁴		Hourly Movements J ⁴		Hourly Movements K1 ⁴	
	HGV	Cars	HGV	Cars	HGV	Cars
0000-0100	1	11	3	9	6	23
0100-0200	1	9	3	7	7	19
0200-0300	2	9	3	7	7	19
0300-0400	2	10	3	8	7	22
0400-0500	2	15	3	13	7	34
0500-0600	2	42	4	34	11	94
0600-0700	3	37	5	31	13	83
0700-0800	3	35	6	29	15	80
0800-0900	3	35	6	29	15	80
0900-1000	3	22	7	19	18	50
1000-1100	3	15	7	13	19	34
1100-1200	3	14	7	11	18	31
1200-1300	3	13	7	11	18	29
1300-1400	3	24	6	20	17	53
1400-1500	3	26	6	21	16	58
1500-1600	3	27	6	23	16	62
1600-1700	3	27	6	23	15	62
1700-1800	2	25	5	21	13	56
1800-1900	3	16	5	14	13	37
1900-2000	3	8	5	7	13	18
2000-2100	2	8	4	7	10	18
2100-2200	2	17	3	14	8	38
2200-2300	2	18	3	15	8	41
2300-2400	2	16	3	14	8	37

T4 Movements for Unit I, J and K1

⁴ 2 way movements (i.e. one entrance and one exit) utilised for model therefore maximum of arrival or departure used)



Expected Zone 1 Traffic Flows used in Model

Period	Hourly Movements K2 ⁵		Hourly Movements L ⁵	
	HGV	Cars	HGV	Cars
0000-0100	5	23	3	9
0100-0200	5	19	3	8
0200-0300	5	19	3	8
0300-0400	5	22	3	9
0400-0500	5	34	3	13
0500-0600	9	93	4	37
0600-0700	10	83	5	33
0700-0800	11	80	6	31
0800-0900	11	80	6	31
0900-1000	13	50	7	20
1000-1100	14	34	7	13
1100-1200	13	31	7	12
1200-1300	13	28	7	11
1300-1400	12	53	6	21
1400-1500	12	58	6	23
1500-1600	12	62	6	24
1600-1700	11	62	6	24
1700-1800	10	56	5	22
1800-1900	10	36	5	14
1900-2000	10	18	5	7
2000-2100	7	18	4	7
2100-2200	6	38	3	15
2200-2300	6	40	3	16
2300-2400	6	36	3	14

T5 Movements for Unit K2 and L

⁵ 2 way movements (i.e. one entrance and one exit) utilised for model therefore maximum of arrival or departure used)



Expected Zone 2 Traffic Flows

Period	Arrivals		Departures		For Model ⁶	
	Shuttle/Tug	Cars	Shuttle/Tug	Cars	Shuttle/Tug	Cars
0000-0100	0.6	8	0.6	8	1	16
0100-0200	0.6	8	0.6	8	1	16
0200-0300	0.7	8	0.7	8	1	16
0300-0400	0.7	8	0.7	8	1	16
0400-0500	0.8	8	0.8	8	1	16
0500-0600	1.3	8	1.3	8	2	16
0600-0700	1.5	8	1.5	8	2	16
0700-0800	1.8	8	1.8	8	2	16
0800-0900	1.8	8	1.8	8	2	16
0900-1000	2.0	8	2.0	8	2	16
1000-1100	2.1	8	2.1	8	3	16
1100-1200	2.2	8	2.2	8	3	16
1200-1300	2.1	8	2.1	8	3	16
1300-1400	2.0	8	2.0	8	2	16
1400-1500	1.9	8	1.9	8	2	16
1500-1600	1.9	8	1.9	8	2	16
1600-1700	1.9	8	1.9	8	2	16
1700-1800	1.6	8	1.6	8	2	16
1800-1900	1.4	8	1.4	8	2	16
1900-2000	1.4	8	1.4	8	2	16
2000-2100	1.0	8	1.0	8	2	16
2100-2200	0.9	8	0.9	8	1	16
2200-2300	1.0	8	1.0	8	1	16
2300-2400	0.8	8	0.8	8	1	16

⁶ 2 way movements (i.e. one entrance and one exit) utilised for model therefore maximum of arrival or departure used)



Zone 1 Operational Activity Description

Activity would consist of Heavy Goods Vehicles accessing and leaving the site throughout the 24 hour day, using any of the proposed parking bays. A single event is described as follows, where each bullet point occurs once per event per hour.

HGV Accessing Site

- HGV arrives onsite, drives to parking bay, reverses into parking bay, cuts engine and shuts door.
- Tug drives to HGV in parking bay, HGV unhitches trailer and tug drives trailer to loading bay, trailer is unloaded, tug returns trailer to HGV after unloading.
- HGV's using fridge packs will not have their diesel generator running while parked. Any refrigeration packs will be electrically hooked up when on-site

HGV Leaving Site

- Lorry door shuts, engine starts and lorry pulls away from bay and HGV driving off site.

Assessment Assumptions

- All HGV's accessing the Units K1, K2 and H2 will have fridge packs which are running when mobile, using their on-board diesel generators. When static in parking bays, the fridge packs on the same vehicles will only operate if electrically hooked up. No Diesel generators will operate when vehicles are static on the site.
- Units G, H1, I, J, and L are served by ambient vehicles only.
- All trailers are serviced by tugs except for Unit G at which it has been confirmed there will be no tugs.
- Acoustic screen at the location indicated on attached Figure D.1/F1
- The limitations refer to HGV movements and not just to parking/loading bays. Any single allowable movement refers to one loading bay being used once in an hour, along with one associated HGV movement process.



Zone 2 Operational Activity Description

Activity would consist of Rail Terminal Shuttles accessing and leaving the site throughout the 24 hour day, using any of the proposed parking bays. A single event is described as follows, where each bullet point occurs once per event per hour.

Shuttle Accessing Site

- Shuttle arrives onsite, drives to container lift, container is lifted off the shuttle and placed on container stack, shuttle reverses into parking bay, cuts engine and shuts door.

Tug On-Site

- Tug pulls away from bay, tug goes to container area, container is loaded from container stack onto tug, tug door shuts, tug pulls away and leaves site

Tug Accessing Site

- Tug arrives onsite, drives to container lift, container is lifted off the tug and placed on container stack, tug reverses into parking bay, cuts engine and shuts door

Shuttle Leaving Site

- Shuttle door shuts, engine start and Shuttle pulling away from bay, goes to container area and a container is loaded on the shuttle, shuttle drives off site

Car Wash

- Two Shuttles/HGVs per hour access the car wash during day time hours

Car Accessing Site

- Car arrives onsite, drives to parking bay, cuts engine and shuts door.

Car Leaving Site

- Car door shutting, engine start and car pulling away from bay and car driving off site



Schedule

Schedule D.1/SCH3-0

Assessment Assumptions

- 90% of shuttles and tugs carry ambient containers, 10% refrigerated vehicles accessing the site with fridge packs running. This is based on worst case assumptions provided by the design team
- The movements refer to shuttle and tug movements and not just to parking/loading bays. Any single allowable movement refers to one loading bay being used once in an hour by a shuttle, along with one associated shuttle movement process (Access and Leave site), one associated tug movement, and one associated container movements (One load and one unload per tug and shuttle movement)



Zone 1 Calculated Assessment Results

Zone 1 Daytime Operational Noise Rating Level without Screening (dB $L_{Ar, 1hour}$)

Period	Result ¹			
	AP2	AP3	AP4	AP0 ²
0700-0800	39	39	42	47
0800-0900	39	39	42	47
0900-1000	40	39	42	48
1000-1100	40	40	42	48
1100-1200	40	39	42	48
1200-1300	40	39	42	48
1300-1400	39	39	42	48
1400-1500	39	39	42	48
1500-1600	39	39	42	48
1600-1700	39	39	41	47
1700-1800	38	38	41	47
1800-1900	38	38	41	47
1900-2000	38	38	40	47
2000-2100	37	37	39	45
2100-2200	36	36	39	45
2200-2300	36	36	39	45
<i>LOAEL Threshold</i>	45	45	48	55
<i>SOAEL Threshold</i>	55	55	58	-

¹ Calculated Noise Level² Scheduled Monument – Non-Residential Receiver

**Zone 1 Night Time Operational Noise Rating Level without Screening (dB $L_{Ar, 15minutes}$)**

Period	AP2	Result ³	
		AP3	AP4
2300-2315	36	36	39
2315-2330	36	36	39
2330-2345	36	36	39
2345-0000	36	36	39
0000-0015	35	35	38
0015-0030	35	35	38
0030-0045	35	35	38
0045-0100	35	35	38
0100-0115	35	35	38
0115-0130	35	35	38
0130-0145	35	35	38
0145-0200	35	35	38
0200-0215	36	35	38
0215-0230	36	35	38
0230-0245	36	35	38
0245-0300	36	35	38
0300-0315	36	35	38
0315-0330	36	35	38
0330-0345	36	35	38
0345-0400	36	35	38
0400-0415	36	35	38
0415-0430	36	35	38
0430-0445	36	35	38
0445-0500	36	35	38
0500-0515	38	37	41
0515-0530	38	37	41
0530-0545	38	37	41
0545-0600	38	37	41
0600-0615	38	38	41
0615-0630	38	38	41
0630-0645	38	38	41
0645-0700	38	38	41
<i>LOAEL Threshold</i>	40	40	40
<i>SOAEL Threshold</i>	45	45	45

³ Calculated Noise Level

**Zone 1 Daytime Operational Noise Rating Level with Screening (dB $L_{Ar, 1hour}$)**

Period	AP2	AP3	Result⁴	AP4	AP0⁵
0700-0800	39	39		41	47
0800-0900	39	39		41	47
0900-1000	40	39		41	48
1000-1100	40	40		41	48
1100-1200	40	39		41	48
1200-1300	40	39		41	48
1300-1400	39	39		41	48
1400-1500	39	39		41	48
1500-1600	39	39		41	48
1600-1700	39	39		41	47
1700-1800	38	38		40	47
1800-1900	38	38		40	47
1900-2000	38	38		40	47
2000-2100	37	37		39	45
2100-2200	36	36		38	45
2200-2300	36	36		38	45
<i>LOAEL Threshold</i>	45	45		48	55
<i>SOAEL Threshold</i>	55	55		58	-

⁴ Calculated Noise Level⁵ Scheduled Monument – Non-Residential Receiver

**Zone 1 Night Time Operational Noise Rating Level with Screening (dB $L_{Ar, 15minutes}$)**

Period	AP2	Result	
		AP3	AP4
2300-2315	36	36	38
2315-2330	36	36	38
2330-2345	36	36	38
2345-0000	36	36	38
0000-0015	35	35	37
0015-0030	35	35	37
0030-0045	35	35	37
0045-0100	35	35	37
0100-0115	35	35	37
0115-0130	35	35	37
0130-0145	35	35	37
0145-0200	35	35	37
0200-0215	36	35	37
0215-0230	36	35	37
0230-0245	36	35	37
0245-0300	36	35	37
0300-0315	36	35	37
0315-0330	36	35	37
0330-0345	36	35	37
0345-0400	36	35	37
0400-0415	36	35	38
0415-0430	36	35	38
0430-0445	36	35	38
0445-0500	36	35	38
0500-0515	38	37	40
0515-0530	38	37	40
0530-0545	38	37	40
0545-0600	38	37	40
0600-0615	38	38	40
0615-0630	38	38	40
0630-0645	38	38	40
0645-0700	38	38	40
<i>LOAEL Threshold</i>	40	40	40
<i>SOAEL Threshold</i>	45	45	45



Calculated Zone 2 Assessment Results

Zone 2 Daytime Operational Noise Rating Level (dB $L_{Ar, 1hour}$)

Period	AP5	Result¹	AP7
0700-0800	44	42	35
0800-0900	44	42	35
0900-1000	46	44	36
1000-1100	46	44	36
1100-1200	46	44	36
1200-1300	46	44	36
1300-1400	46	44	36
1400-1500	44	42	35
1500-1600	44	42	35
1600-1700	44	42	35
1700-1800	44	42	35
1800-1900	44	42	35
1900-2000	44	42	35
2000-2100	41	40	32
2100-2200	41	40	32
2200-2300	41	39	32
<i>LOAEL Threshold</i>	54	45	45
<i>SOAEL Threshold</i>	64	55	55

¹ Calculated Noise Level

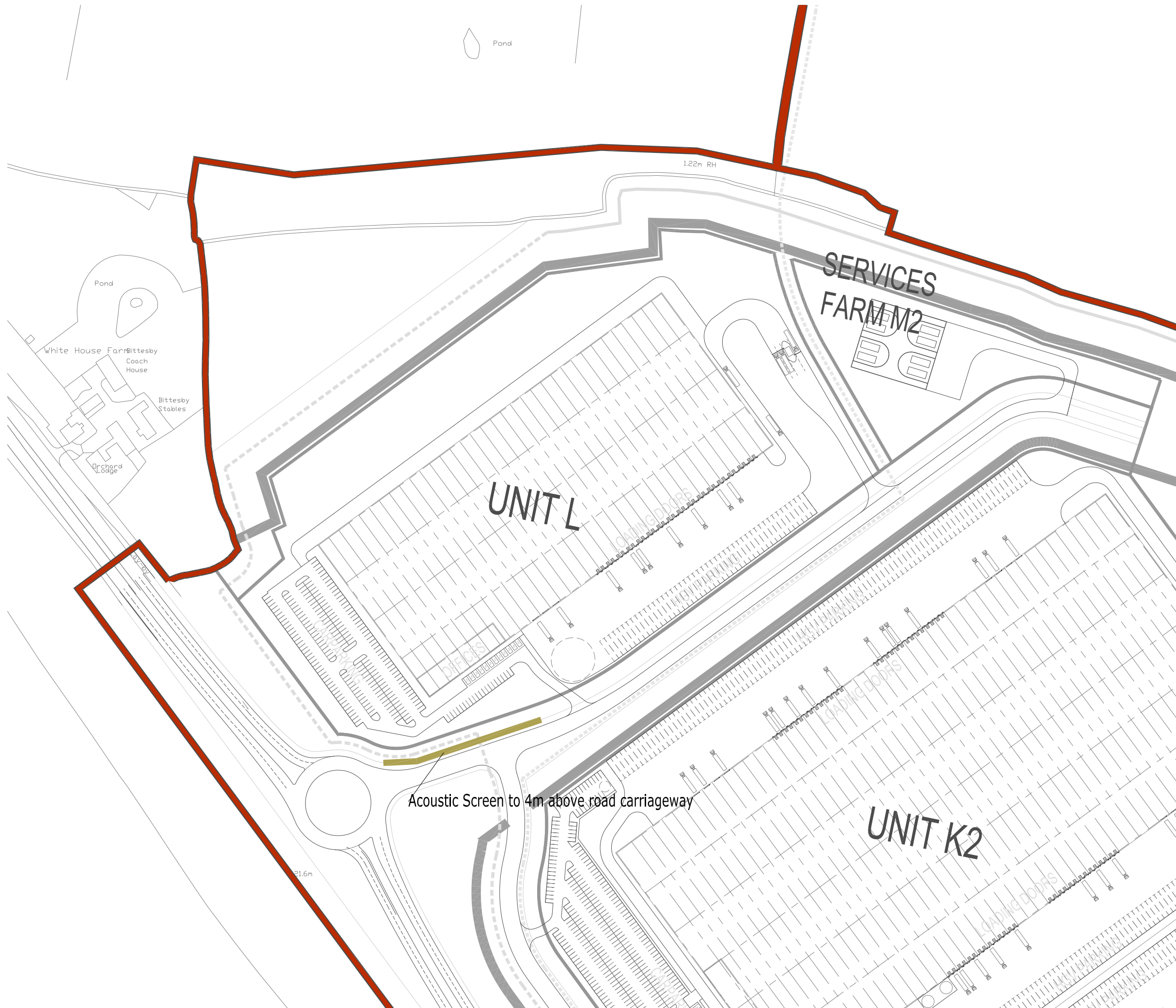
**Zone 2 Night Time Operational Noise Rating Level (dB $L_{Ar, 15minutes}$)**

Period	AP5	Result	
		AP6	AP7
2300-2315	41	39	32
2315-2330	41	39	32
2330-2345	41	39	32
2345-0000	41	39	32
0000-0015	41	39	32
0015-0030	41	39	32
0030-0045	41	39	32
0045-0100	41	39	32
0100-0115	41	39	32
0115-0130	41	39	32
0130-0145	41	39	32
0145-0200	41	39	32
0200-0215	41	39	32
0215-0230	41	39	32
0230-0245	41	39	32
0245-0300	41	39	32
0300-0315	41	39	32
0315-0330	41	39	32
0330-0345	41	39	32
0345-0400	41	39	32
0400-0415	41	39	32
0415-0430	41	39	32
0430-0445	41	39	32
0445-0500	41	39	32
0500-0515	44	42	35
0515-0530	44	42	35
0530-0545	44	42	35
0545-0600	44	42	35
0600-0615	44	42	35
0615-0630	44	42	35
0630-0645	44	42	35
0645-0700	44	42	35
<i>LOAEL Threshold</i>	45	40	40
<i>SOAEL Threshold</i>	50	45	45

Figure D.1/F1

Title:

Plan Showing proposed mitigation to Zone 1 development



Project:

Magna Park Extension: Hybrid Application

Date:

September 2015

Revision:

-

Scale:

Not to scale

Plan D.1/NM1

Subject: Noise Management Plan Principles
Project: Magna Park Extension: Hybrid Application
Date: September 2015

1 Best Practice Operation

1.1 Noise Sources

- 1.1.1 The main noise sources associated with B8 operations will result from Heavy Goods Vehicle (HGV) movements. The attendant noise issues are stated below, along with recommendations for best practice operation to minimise noise impacts.

1.2 Vehicle Movements and Engine Noise

- 1.2.1 Once onsite, HGV engines should only be switched on when necessary for manoeuvring. At all other times engines should be switched off.
- 1.2.2 Unnecessary revving of engines should be avoided.
- 1.2.3 HGV horns should not be used onsite at any time, except in emergencies.
- 1.2.4 Coupling and uncoupling of trailers should be minimised, through good planning, to avoid unnecessary repeat occurrences.
- 1.2.5 Refrigeration units within both zones should be hooked up electrically at all times when static. Diesel generators should only be in use when the HGVs are moving.
- 1.2.6 Drivers should be encouraged to plan ahead, to avoid unnecessary acceleration, braking and reversing.

1.3 Reversing Sounders

- 1.3.1 Reversing beepers are designed to be noticeable and heard over background noise. They are necessary for health and safety reasons. However noise levels due to reversing sounders are acceptable provided that they are within suitable limits.
- 1.3.2 To further minimise noise levels, it is good practice to reverse only when necessary i.e. when manoeuvring into a parking or loading bay.



1.3.3 “White noise” type reversing sounders are often considered less intrusive than the traditional “beeper” type. Whilst not essential, use of white noise sounders where possible may be beneficial.

1.4 **Loading and Unloading Noise**

1.4.1 When the trailers are at the dock leveller loading bays, it is important that they are properly docked, to ensure a good connection between the building and trailer, thereby minimising noise emission through any gaps.

1.4.2 Where level access loading bays are concerned, the trailers are loaded /unloaded using fork lifts. All fork lifts should be fitted with rubber tyres and should be gas powered, where possible, to minimise engine noise.

1.4.3 External fork lift activity should be minimised as far as possible.

1.4.4 Public address systems should be installed within the warehouse only, not externally (except if required for emergency use).

1.4.5 When bays are not in use, the doors must be closed, to avoid noise break out from the building through an open doorway.

1.4.6 All loading and unloading should be undertaken with suitable care and attention, in order to minimise unnecessary noise generation. Activities such as shouting and unnecessary dropping of items within trailers should be avoided.

■ End of Section



Glossary of Acoustic Terms

L_{Aeq} :

The notional steady sound level (in dB) which over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measurement over that period. Values are sometimes written using the alternative expression dB(A) L_{eq} .

L_{Amax} :

The maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise when occasional loud noises occur, which may have little effect on the L_{Aeq} noise level. Unless described otherwise, L_{Amax} is measured using the “fast” sound level meter response.

L_{A10} & L_{A90} :

If non-steady noise is to be described, it is necessary to know both its level and degree of fluctuation. The L_{An} indices are used for this purpose. The term refers to the A-weighted level (in dB) exceeded for n% of the time specified. L_{A10} is the level exceeded for 10% of the time and as such gives an indication of the upper limit of fluctuating noise. Similarly L_{A90} gives an indication of the lower levels of fluctuating noise. It is often used to define the background noise.

L_{A10} is commonly used to describe traffic noise. Values of dB L_{An} are sometimes written using the alternative expression dB(A) L_n .

L_{AX} , L_{AE} or SEL

The single event noise exposure level which, when maintained for 1 second, contains the same quantity of sound energy as the actual time varying level of one noise event. L_{AX} values for contributing noise sources can be considered as individual building blocks in the construction of a calculated value of L_{Aeq} for the total noise. The L_{AX} term can sometimes be referred to as Exposure Level (L_{AE}) or Single Event Level (SEL).

