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MILLER HOMES STRATEGIC LAND

LAND OFF STOURBRIDGE ROAD/HURCOTT LANE, KIDDERMINSTER

NOISE ASSESSMENT REPORT

December 2015

your earth our world



DATE ISSUED: December 2015
JOB NUMBER: WM11061
REPORT NUMBER: 001

Miller Homes Strategic Land

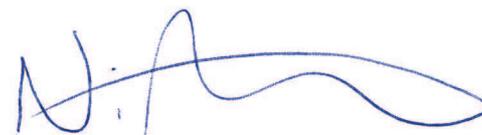
Land off Stourbridge Road/Hurcott Lane, Kidderminster

Noise Assessment Report

December 2015

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1 INTRODUCTION

- 1.1.1 By email instruction from Miller Homes Strategic Land, Wardell Armstrong LLP was commissioned to undertake a noise assessment for a proposed residential development at land off Stourbridge Road, Kidderminster, Worcestershire.
- 1.1.2 The proposed development site is located in the north east of Kidderminster and currently comprises open land. To the north east, the site is bordered by Hurcott Lane, with open land beyond. To the south east, the site is bordered by open land. To the south west, the site is bordered by existing residential properties located on Kendlewood Road. To the north west, the site is bordered by the A451 Stourbridge Road, with open land beyond.
- 1.1.3 The proposed development is residential in nature and will comprise approximately 120 dwellings. The location of the site is shown on drawing number WM11061-001.
- 1.1.4 This noise report has been prepared in support of the outline planning application, and assesses the results of a noise survey carried out in accordance with current guidance and includes recommendations for noise mitigation as appropriate.

2 ASSESSMENT METHODOLOGY

2.1 Consultation and Scope of Works

2.1.1 Prior to carrying out the noise assessment the potential impacts of the proposed development and general principles of the assessment methodology were sent to Mr Steve Williams, Technical Officer Community Protection at Worcester Regulatory Services. Mr Williams stated that our proposed methodology was acceptable.

2.1.2 The scope of the noise assessment includes consideration of noise at sensitive areas of the proposed development, i.e. proposed residential areas, specifically in terms of the potential impact of existing transportation noise and any other noise sources, and is in line with current guidance.

2.2 Noise Survey

2.2.1 As part of this assessment, Wardell Armstrong LLP has carried out an attended noise survey to assess the current noise levels at proposed receptor locations.

2.2.2 The potential sources of noise are; road traffic on Stourbridge Road, Hurcott Lane and the surrounding road network.

2.3 Assessment Methodology

2.3.1 An assessment is required to consider any potentially noise sensitive areas of the site. The potential impacts of the existing and future sources of noise, on the proposed residential area of the development have been assessed with reference to;

- National Planning Policy Framework, 2012; (NPPF);
- Planning Practice Guidance – Noise, 2014;
- Noise Policy Statement for England 2010; (NPSE);
- World Health Organisation Guidelines For Community Noise 1999 (WHO); and
- British Standard 8233: 2014 Guidance on sound insulation and noise reduction for buildings (BS8233).

National Planning Policy Framework

2.3.2 In March 2012 the ‘National Planning Policy Framework’ (NPPF) was introduced as the current planning policy guidance within England. Paragraph 123 of the NPPF states:

‘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;*
- *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;*
- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and*
- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.'*

2.3.3 With regard to 'adverse impacts' the NPPF refers to the 'Noise Policy Statement for England' (NPSE), which defines three categories, as follows:

'NOEL – No Observed Effect Level

- *This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.*

LOAEL – Lowest Observed Adverse Effect Level

- *This is the level above which adverse effects on health and quality of life can be detected.*

SOAEL – Significant Observed Adverse Effect Level

- *This is the level above which significant adverse effects on health and quality of life occur'.*

2.3.4 The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided. The second aim refers to the situation where the impact lies somewhere between LOAEL and SOAEL, and it requires that all reasonable steps are taken to mitigate and minimise the adverse effects of noise. However the requirement to mitigate and minimise the adverse effects of noise does not mean that such adverse effects cannot occur.

2.3.5 The Planning Practice Guidance (PPG) provides further detail about how the effect levels can be recognised. Above the NOEL noise becomes noticeable, however it has no adverse effect as it does not cause any change in behaviour or attitude. Once noise

crosses the LOAEL threshold it begins to have an adverse effect and consideration needs to be given to mitigating and minimising those effects, taking account of the economic and social benefits being derived from the activity causing the noise. Increasing noise exposure further might cause the SOAEL threshold to be crossed. If the exposure is above this level the planning process should be used to avoid the effect occurring by use of appropriate mitigation such as by altering the design and layout. Such decisions must be made taking account of the economic and social benefit of the activity causing the noise, but it is undesirable for such exposure to be caused. At the highest extreme the situation should be prevented from occurring regardless of the benefits which might arise. Table 1 summarises the noise exposure hierarchy.

Table 1 National Planning Practice Guidance noise exposure hierarchy			
Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
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 Observed adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
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; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	

Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. 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.	Significant Observed Adverse Effect	Avoid
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.	Unacceptable Adverse Effect	Prevent

2.3.6 The Noise Policy Statement for England refers to the World Health Organisation (WHO) when discussing noise impacts. The WHO Guidelines for Community Noise 1999 suggest guideline values for internal noise exposure which take into consideration the identified health effects and are set, based on the lowest effect levels for general populations. Guideline values for annoyance which relate to external noise exposure are set at 50 or 55 dB(A), representing day time levels below which a majority of the adult population will be protected from becoming moderately or seriously annoyed respectively.

2.3.7 The following guideline values are suggested by WHO:

- 35 dB L_{Aeq} (16 hour) during the day time in noise sensitive rooms
- 30 dB L_{Aeq} (8 hour) during the night time in bedrooms
- 45 dB L_{Amax} (fast) during the night time in bedrooms
- 50 dB L_{Aeq} (16 hour) to protect majority of population from becoming moderately annoyed
- 55 dB L_{Aeq} (16 hour) to protect majority of population from becoming seriously annoyed

2.3.8 British Standard 8233 “Guidance on sound insulation and noise reduction for buildings” 2014 bases its advice on the WHO Guidelines. In addition, for internal noise levels it states;

“Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.”

2.3.9 Furthermore, with regard to external noise, the Standard states;

“For traditional external areas that are used for amenity space such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq, T}$ with an upper guidance value of 55 dB $L_{Aeq, T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited”.

2.3.10 The PPG summarises the approach to be taken when assessing noise. It accepts that noise can override other planning concerns, but paragraph 002 of the noise guidance states:

“Neither the Noise Policy Statement for England nor the National Planning Policy Framework (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separate from the economic, social and other environmental dimensions of proposed development”.

3 NOISE SURVEY

3.1.1 On the 7th May 2015 Wardell Armstrong LLP carried out a noise survey across the development site.

3.1.2 Attended noise measurements were taken at two monitoring locations, which are considered to be representative of proposed residential receptors nearest to the dominant noise sources. The monitoring locations are as follows, and are shown on Drawing Number WM11061-001:

- Monitoring Location 1: In the northern part of the development site, approximately 10m from the boundary adjacent to Stourbridge Road.
- Monitoring Location 2: In the eastern part of the development site, approximately 10m from the boundary adjacent to Hurcott Lane.

3.1.3 Attended noise monitoring was carried out during the following periods:

- Between 0500 and 0941 hours; and
- Between 1133 and 1433 hours, at Monitoring Locations 1. This included 3 hours of consecutive measurements between 1000 and 1700 hours, in accordance with the shortened measurement procedure in the Department of Transport's technical memorandum 'Calculation of Road Traffic Noise' 1988 (CRTN).

3.1.4 The noise measurements were made using a Class 1, integrating sound level meter. The sound level meter was mounted vertically on a tripod 1.2m above the ground. The sound level meter was calibrated to a reference level of 94dB at 1kHz both before, and on completion of, the noise survey. No drift in the calibration during the survey was noted.

3.1.5 On the 7th May, the weather conditions during the survey were as follows:

- South westerly winds up to 4m/s;
- Damp ground;
- Temperature approximately +3°C to +10 °C; and
- 80% cloud cover.

3.1.6 For the purpose of this assessment daytime hours are taken to be 0700 to 2300 hours and night-time hours to be 2300 to 0700 hours.

3.1.7 A-weighted¹ L_{eq} ² noise levels were measured to comply with the requirements of WHO. A-weighted L_{90} ³ and L_{10} ⁴ noise levels, together with the maximum and minimum sound pressure levels, were also measured to provide additional information. The measured noise levels are set out in full in Appendix A.

3.1.8 Attended noise monitoring allows observations and detailed notes to be made of the significant noise sources which contribute to each of the measured levels. The observations identified the following:

Road Traffic Noise: Noise from road traffic on Stourbridge Road, Hurcott Lane, and the surrounding road network was audible at both monitoring locations throughout the noise survey. A reduction in the level of road traffic noise was noted during the night time.

Birdsong: Birdsong was audible at both locations during the daytime and night-time periods;

Other: Noise from high and low level aircraft, was audible at both monitoring locations during the daytime noise survey.

¹ A' Weighting An electronic filter in a sound level meter which mimics the human ear's response to sounds at different frequencies under defined conditions
² L_{eq} Equivalent continuous noise level; the steady sound pressure which contains an equivalent quantity of sound energy as the time-varying sound pressure levels.
³ L_{90} The noise level which is exceeded for 90% of the measurement period.
⁴ L_{10} The noise level which is exceeded for 10% of the measurement period.

4 NOISE IMPACT ASSESSMENT

4.1 Existing Noise Levels

4.1.1 The measured noise levels for each monitoring location have been divided into daytime (0700-2300 hours) and night-time (2300-0700 hours) categories.

4.1.2 The individual levels have been arithmetically averaged to give a single daytime and night-time level for each location. The results for each of the monitoring locations are presented in Table 2.

Table 2: Average Daytime and Night-time Noise Levels		
Time	Monitoring Location	Measured Noise Level (Figures in dB L _{Aeq})
0700-2300	1	62*
2300-0700		56
0700-2300	2	55
2300-0700		55

* A daytime noise level of 62 dB L_{Aeq} was calculated from the 3 consecutive one hour measurements at monitoring location 1 using the CRTN shortened measurement procedure, and the TRL L_{A10} to L_{Aeq} adjustment method. The average measured daytime noise level, including peak hour traffic, was however lower at 56 dB L_{Aeq}. The higher level has been used in this assessment to be robust.

4.1.3 Based on the results obtained, a robust assessment can be made of the noise levels at the site and of the mitigation necessary to achieve the required noise levels at the development.

4.1.4 The maximum noise levels, measured during the night-time period of the survey, are summarised in Table 3.

Table 3: Summary of the Maximum Night-time Noise Levels (Figures in dB L _{Amax})	
Monitoring Location	Maximum Measured Noise Level
1	70
2	72

4.2 WHO Assessment of Daytime Noise Levels in Outdoor Living Areas

- 4.2.1 Table 2 shows that during the daytime, the higher noise levels affecting the development site are between 55dB L_{Aeq} and 62dB L_{Aeq} . With the exception of the northern edge of the site, all other areas of the site will meet the WHO recommended guideline value of 55dB $L_{Aeq(16\text{ hour})}$.
- 4.2.2 Noise levels are above the recommended guideline value adjacent to the Stourbridge Road. Therefore mitigation will be required for dwellings closest to and with direct line of sight of Stourbridge Road.

4.3 WHO and BS8233 Assessment of Daytime Noise Levels in Living Rooms and Bedrooms

- 4.3.1 Before internal noise levels can be calculated 3dB(A) must be added to the freefield measured levels to allow for the reflection of noise from the proposed housing façades when the buildings are in place.
- 4.3.2 The measured daytime noise levels, as detailed in Table 2, have been used to determine the noise levels likely at the façades of properties in the vicinity of the monitoring locations during the daytime period.
- 4.3.3 The calculated noise levels at the façades of the properties, together with the level of attenuation required to achieve 35dB L_{Aeq} in the living room and bedroom areas, are summarised in Table 4.

Table 4: Façade Noise Level at Properties in the Vicinity of the Monitoring Locations and Level of Attenuation Required to Achieve the Internal Daytime Noise Limit (Figures in dB(A))		
Residential Properties	Noise Level at the Façade of the Property	Level of Attenuation Needed To Achieve Noise Limit in Living Room and Bedroom Areas
Residential properties in northern parts of the site closest to Stourbridge Road, i.e. Monitoring Location 1	65	30
Residential properties in eastern parts of the site closest to Hurcott Lane, i.e. Monitoring Location 2	58	23

- 4.3.4 The facades of the properties further into the site will be protected by the buildings themselves and/or screened by other buildings. It is considered that the noise levels

at these facades, and therefore the level of attenuation the facades would need to provide to achieve 35dB L_{Aeq} in the living room and bedroom areas, will be less than those detailed in Table 4.

4.4 Assessment of Night-time Noise Levels in Bedrooms

4.4.1 The measured night-time noise levels, as detailed in Tables 2 and 3, have been used to determine the noise levels likely at the façades of properties across the site, during the night-time period.

4.4.2 Before internal noise levels can be calculated 3dB(A) must be added to the freefield measured levels to allow for the reflection of noise from the proposed housing facades when the buildings are in place.

4.4.3 The calculated noise levels at the façades of properties, together with the level of attenuation required to achieve 30dB L_{Aeq} and 45dB $L_{Amax,f}$ in the bedrooms, are summarised in Table 5.

Table 5: Façade Noise Level at Properties in the Vicinity of the Monitoring Locations and Level of Attenuation Required to Achieve the Internal Night-time Noise Limit (Figures in dB(A))			
Residential Properties	Noise Level at the Façade of the Property (L_{Aeq})	Maximum Noise Level at the Façade of the Property (L_{Amax})	Level of Attenuation Needed To Achieve the Noise Limits in Bedrooms
Residential properties in northern parts of the site closest to Stourbridge Road, i.e. Monitoring Location 1	59	73	29
Residential properties in eastern parts of the site closest to Hurcott Lane, i.e. Monitoring Location 2	58	75	30

4.4.4 The facades of the properties further into the site will be protected by the buildings themselves and/or screened by other buildings. It is considered that the noise levels at these facades, and therefore the level of attenuation the facades would need to provide to achieve the 30dB L_{Aeq} and 45dB $L_{Af,max}$ in the bedrooms, will be less than those detailed in Table 5.

5 NOISE ATTENUATION SCHEME

5.1 Introduction

5.1.1 The results of the noise assessment, for the proposed residential areas of the development, indicate that noise mitigation measures would need to be incorporated into the proposed site design to ensure that the required noise levels are achieved within outdoor living areas, internal living rooms and bedrooms.

5.2 Daytime Noise Levels in Outdoor Living Areas

5.2.1 The measured noise levels, as detailed in Table 2 and section 4.2 of this report, indicate that mitigation measures will be required to ensure that outdoor living areas in northern parts of the site achieve the recommended outdoor noise guideline value.

5.2.2 To mitigate traffic noise levels in outdoor living areas located closest to, and with a direct line of sight of Stourbridge Road in the northern part of the site, gardens could be located on the screened sides of dwellings, i.e. not located with a direct line of sight to the road.

5.2.3 Alternatively, if gardens are to be located between Stourbridge Road and the dwellings, close boarded fencing of 1.8m in height should be sufficient to protect garden areas located closest to, and with a direct line of sight of Stourbridge Road in the northern parts of the proposed development. However it should be noted that the final height and location of noise barriers will depend upon the final layout of the site.

5.2.4 Mitigation requirements can be confirmed on a plot by plot basis, once a detailed design layout is available.

5.3 Glazing Requirements for Daytime in Bedrooms and Living Room Areas

5.3.1 When assessing daytime noise levels in living rooms and bedrooms, the noise attenuation provided by the overall building facade should be considered. To mitigate noise levels the composition of the building facade can be designed to provide the level of attenuation required. Glazing is generally the building element which attenuates noise the least, so the proportion of glazing in a building facade is an important consideration when assessing overall noise attenuation.

- 5.3.2 In the absence of design details for the building facades, it has been assumed that the glazing to noise sensitive rooms would comprise about 25% of the facade area. To calculate the overall attenuation provided by this percentage of glazing in a brick or block facade, a non-uniform partition calculation can be used.
- 5.3.3 The calculation combines the different degrees of attenuation of the wall element and the window element. A facade element comprising solid brick or blockwork, will attenuate by 45-50dB (British Standard 8233: "Sound insulation and noise reduction for buildings – Code of practice" 1999) whereas standard double glazing will attenuate road traffic noise by 26-29dB(A) (BRE Digest 379 "Double glazing for heat and sound insulation"). The overall noise attenuation provided by this combination is, therefore, between 31.9dB(A) and 34.9dB(A).
- 5.3.4 The noise attenuation requirements for living rooms and bedrooms during the daytime in properties, in different areas of the site are summarised in Table 4. The requirements indicate that standard thermal double glazing should ensure that internal noise levels are met with the windows closed. However, with windows open, the attenuation provided by the façade will be approximately 15dB(A). This would potentially allow the recommended internal noise limit to be exceeded in some living rooms in northern and eastern parts of the site, located nearest to and facing Stourbridge Road, and Hurcott Lane.
- 5.3.5 On occasions, this may be acceptable to a resident, but when quiet conditions are required, the resident should be able to close the windows whilst maintaining adequate ventilation. Some form of acoustic ventilation would therefore need to be installed in some of the living rooms in northern and eastern parts of the site. Alternatively, to meet the required noise levels, living rooms could be located on the screened side of the proposed buildings, away from the main source of noise.
- 5.3.6 Proposed dwellings further into the site, will be protected by the buildings themselves and/or screened by other buildings, from the main sources of noise. These façades are likely to achieve 35dB L_{Aeq} in living rooms which can be provided by standard thermal double glazing, even with windows open.
- 5.3.7 Glazing and ventilation requirements can be confirmed, on a plot by plot basis, at the reserved matters stage.

5.4 Glazing Requirements for Night-time in Bedroom Areas

- 5.4.1 The noise attenuation requirements for bedrooms across the site are summarised in Table 5.
- 5.4.2 The requirements indicate that standard thermal double glazing, as detailed in paragraph 5.3.3, would ensure that the internal noise limits are met for proposed dwellings across the site,
- 5.4.3 However, with windows open, the attenuation provided by the façade will be approximately 15dB(A). This would allow the recommended internal noise limit to be exceeded in bedrooms located in southern and western parts of the site, located nearest to and facing Stourbridge Road, and Hurcott Lane.
- 5.4.4 Acoustic ventilation would therefore need to be installed in some of the bedrooms nearest to Stourbridge Road, and Hurcott Lane. Alternatively, to meet the required noise levels, bedrooms could be located on the screened side of the proposed buildings, away from the main sources of noise.
- 5.4.5 Proposed dwellings further into the site, will be protected by the buildings themselves and/or screened by other buildings, from the main sources of noise. These façades are likely to achieve 30dB L_{Aeq} in bedrooms which can be provided by standard thermal double glazing, even with windows open.
- 5.4.6 Glazing and ventilation requirements can be confirmed, on a plot by plot basis, at the reserved matters stage.

5.5 Acoustic Ventilation Requirements

- 5.5.1 It is recommended that the acoustic ventilation proposed at the site should, as a minimum, comply with Building Regulations 2000 Approved Document F1 Means of Ventilation and British Standard BS5925 1991: "Code of Practice for Ventilation Principles and Designing for Natural Ventilation". Acoustic ventilation is only recommended for noise sensitive rooms, which are bedrooms and living/dining rooms.
- 5.5.2 The implementation of the recommended glazing together with appropriate acoustic ventilation should ensure that the required internal daytime and night-time noise limits are achieved.

5.5.3 The façades of some of the properties further into the site will be protected by the buildings themselves and/or screened by other buildings. Therefore, acoustic ventilation may not be required for these plots. The requirement for acoustic ventilation can be confirmed on a plot by plot basis at the reserved matters stage.

6 CONCLUSIONS

- 6.1.1 Wardell Armstrong has carried out a noise assessment for the proposed residential development located at land off Stourbridge Road, Kidderminster, Worcestershire.
- 6.1.2 The dominant noise source, which will potentially affect the residents of the proposed residential development, is road traffic on Stourbridge Road and Hurcott Lane.
- 6.1.3 In policy terms there is no presumption against development in places with high noise levels, provided that the noise can be adequately mitigated taking into account the economic and social benefits of the proposed scheme.
- 6.1.4 The resultant noise levels can be assessed against the guideline values suggested by the World Health Organisation. It should be remembered that the internal guideline values are health-based and are therefore relatively inflexible; however adequate noise mitigation is relatively straightforward to engineer. The external guideline values are based on amenity and allow noise to be balanced against any benefits which flow from the location of the proposed scheme.
- 6.1.5 The results of the noise survey and assessment indicate that to meet the guideline value of $55\text{dB}_{\text{Leq}}(16\text{ Hour})$ in outdoor living areas, acoustic mitigation should be provided for those areas located with a direct line of sight of Stourbridge Road in northern parts of the development.
- 6.1.6 Gardens could be located on the screened sides of dwellings. i.e. not located with a direct line of sight to Stourbridge Road. Alternatively it is recommended that standard close boarded fencing or walls of 1.8m in height are installed between the gardens and the carriageway of Stourbridge Road in the northern parts of the site. Mitigation requirements will depend upon the detailed design of the proposed development and upon the local topography.
- 6.1.7 The noise assessment indicates that standard thermal double glazing would ensure that internal noise limits are met in living rooms and bedrooms across the development site, with the windows closed.
- 6.1.8 However, with the windows open the attenuation provided by the façade would allow the internal noise limits to be exceeded in living rooms and bedrooms located nearest to Stourbridge Road in the north, and Hurcott Lane in the east.

- 6.1.9 Acoustic ventilation would therefore need to be installed in some of the living rooms bedrooms located nearest to Stourbridge Road, and Hurcott Lane. Alternatively, to meet the required noise levels, living rooms and bedrooms could be located on the screened side of the proposed buildings, away from the main sources of noise.
- 6.1.10 At this stage, a detailed site layout has not yet been confirmed. Glazing requirements will need to be confirmed once a detailed design layout is available.

Appendix A

Noise Monitoring Results

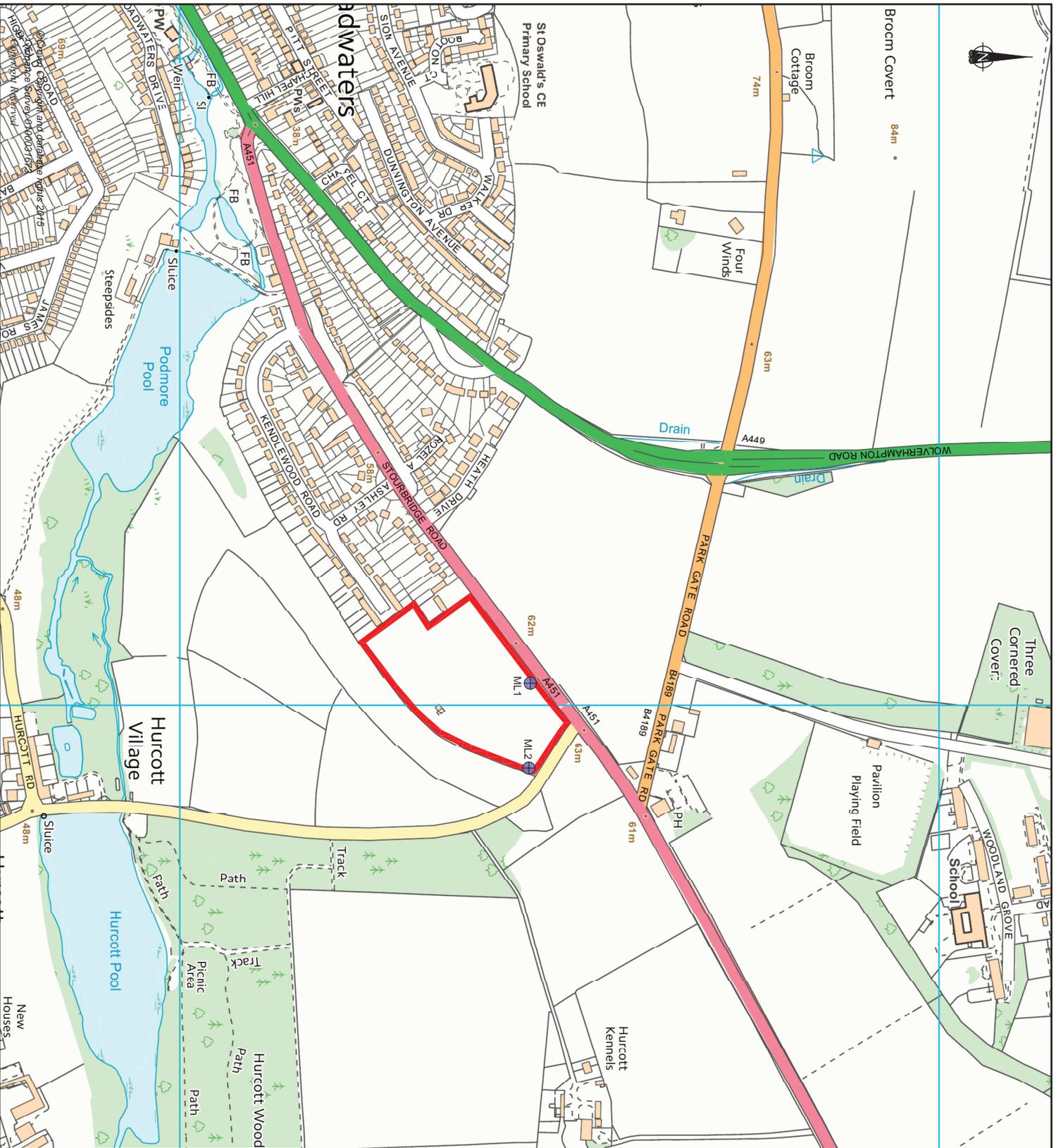
Appendix A
Noise Monitoring Results

Monitoring Location 1 – 10m from Northern boundary adjacent to Stourbridge Road						
Time	L _{Aeq} (dB)	L _{A min} (dB)	L _{A max} (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
07/05/2015 - Night Time						
0500-0525	54.5	40.1	66.8	43.7	59.1	Noise from occasional road traffic along Stourbridge Road. Distant road traffic to the north west. Birdsong.
0603-0628	56.9	44.4	69.7	46.9	61.3	Noise from occasional road traffic along Stourbridge Road. Distant road traffic to the north west. Birdsong.
07/05/2015 - Daytime						
0739-0804	56.9	42.1	72.9	47.1	60.4	Noise from frequent road traffic along Stourbridge Road. Distant road traffic to the north west. Birdsong.
0843-0908	56.0	40.3	73.3	44.5	59.6	Noise from frequent road traffic along Stourbridge Road. Distant road traffic to the north west. Birdsong.
1133-1233	59.8	38.5	80.2	43.0	65.0	Noise from frequent road traffic along Stourbridge Road. Distant road traffic to the north west. Noise from high and low level aircraft. Noise from wind in trees. Birdsong.
1233-1333	58.8	38.8	78.2	43.1	63.9	
1333-1433	57.4	37.1	73.1	42.1	62.4	

Monitoring Location 2 – 10m from eastern boundary adjacent to Hurcott Lane						
Time	L _{Aeq} (dB)	L _{A min} (dB)	L _{A max} (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
07/05/2015 - Night Time						
0534-0559	54.1	40.0	71.6	44.8	58.2	Noise from several cars along Hurcott Lane. Distant road traffic to the east. Birdsong.
0638-0703	53.7	41.9	72.1	44.6	57.1	Noise from several cars along Hurcott Lane. Distant road traffic to the east. Birdsong.
07/05/2015 - Daytime						
0814-0839	55.8	37.8	77.4	43.9	57.5	Noise from occasional cars along Hurcott Lane. Distant road traffic to the east. Birdsong.
0916-0941	54.1	38.0	77.9	42.9	56.9	Noise from frequent cars along Hurcott Lane. Distant road traffic to the east. Birdsong.

Drawings

Noise Monitoring Locations



DO NOT SCALE FROM THIS DRAWING A3

- KEY**
- Site Boundary
 - ML1 Noise Sensitive Receptor Location

REVISION	DATE	BY	DESCRIPTION
A			First Issue

CLIENT: **Miller Homes Ltd**

PROJECT: **Site off Stourbridge Road/Hurcott Lane, Kidderminster**

DRAWING TITLE: **Noise Monitoring Locations**

DRG. NO. **WM11061-001** SCALE **1:5000@A1** DATE **13/05/15**

DRAWN BY **DR** CHECKED BY **NA** APPROVED BY **MD**

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