



# One Earth Solar Farm

**Volume 6.0 Environmental Statement [EN010159]**

**Volume 3: Technical Appendices Supporting ES Volume 2**

**Appendix 15.3: Construction Noise and Vibration Assessment**

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# Contents

<b>Contents</b>	<b>1</b>
<b>Glossary</b>	<b>2</b>
<b>List of Abbreviations and Acronyms</b>	<b>3</b>
<b>A.15 Appendix 15.3 Construction Noise and Vibration Assessment</b>	<b>4</b>
A.15.1 Introduction _____	4
A.15.2 Construction Traffic Noise and Vibration _____	4
A.15.3 On-site Construction Activities _____	8
A.15.4 HDD Operations _____	18

## Glossary

Term	Meaning
dB: Decibel	The logarithmically scaled measurement unit of sound.
A-weighting	Frequency weighting applied to measured sound in order to account for the relative loudness perceived by the human ear.
$L_{Aeq,T}$	A-weighted equivalent continuous sound level over a given time period. It is the sound level of a steady sound that has the same energy as a fluctuating sound over the same time period.
$L_{A90,T}$	The A-weighted sound level exceeded for 90% of the measurement period. Often referred to as the background sound level.
Peak particle velocity (PPVV)	A measure of the magnitude of vibration, representing the greatest instantaneous particle velocity in a given time period. Measured in mm/s.

## List of Abbreviations and Acronyms

Term	Meaning
LOAEL	Lowest Observed Adverse Effect Level
SOAEL	Significant Observed Adverse Effect Level
UAEL	Unacceptable Adverse Effect Level
BNL	Basic Noise Level
AAWT	Annual Average Weekday Traffic
HDD	Horizontal Directional Drilling
BESS	Battery Energy Storage System

## A.15 Appendix 15.3 Construction Noise and Vibration Assessment

### A.15.1 Introduction

- A.15.1.1. An assessment of the likely impacts of construction noise and vibration has been carried out for the Proposed Development, based on the details available at the time of writing. It should be noted that precise details of the likely construction plant and equipment that will be needed on the site is not available at this stage, therefore the plant required on-site in order to complete the various construction activities that will be necessary has been estimated based on previous experience of similar projects.

### A.15.2 Construction Traffic Noise and Vibration

#### Study Area

- A.15.2.1. The study area for the assessment of potential effects of construction traffic is shown in **ES Volume 3, Figure 15.4: Study Areas [EN010159/APP/6.20]**. This includes all noise sensitive properties within 50 m of either an internal access track or a road link identified in the traffic assessment as carrying construction traffic.
- A.15.2.2. As can be seen from **ES Volume 3, Figure 15.6: Construction Noise Study Area and Sensitive Receptors [EN010159/APP/6.20]**, receptors within the study are include:
- > Far Hill Farm, Farhill, Lane, Ragnall
  - > Station House, Fledborough
  - > 1 Station Cottage, Fledborough
  - > 2 Station Cottage Fledborough
  - > The Gables, Fledborough
  - > The Chase, Main Road, South Clifton
  - > The Gables Bungalow, Fledborough

#### Assessment Criteria

- A.15.2.3. Potential impacts of noise from offsite construction traffic are assessed against the construction traffic noise criteria given in the Design Manual for Roads and Bridges LA 111 (Table 3.17). These criteria are set out in **Table 1** below.

*Table 1 Criteria for magnitude of off-site construction traffic noise impacts, from LA111.*

Magnitude of Impact	Increase in BNL of closest public road used for construction traffic (dB)
Major	Greater than or equal to 5.0
Moderate	Greater than or equal to 3.0 and less than 5.0
Minor	Greater than or equal to 1.0 and less than 3.0
Negligible	Less than 1.0

- A.15.2.4. Since the onsite access tracks do not currently carry traffic, and therefore the change in road traffic noise level is not applicable, the assessment of noise from vehicle movements on these tracks has been carried out with reference to the criteria set out in BS 5228-1:2009+A1:2014, Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1, Noise. The criteria adopted for this assessment are set out in **Table 2** below.

*Table 2 Criteria for magnitude of on-site construction traffic noise impacts, adapted from BS 5228.*

Magnitude of Impact	Level of noise from on-site construction traffic (dBA)
Unacceptable	Greater than 85 dB(A)
<i>Unacceptable Adverse Effect Level (UAEL) = 85 dB(A)</i>	
Major	Greater than or equal to 75 dB(A) and less than 85 dB(A)
<i>Significant Observed Adverse Effect Level (SOAEL) = 75 dB(A)</i>	
Moderate	Greater than or equal to 70 dB(A) and less than 75 dB(A)
Minor	Greater than or equal to 65 dB(A) and less than 70 dB(A)
<i>Lowest Observed Adverse Effect Level (LOAEL) = 65 dB(A)</i>	
Negligible	Less than 65 dB(A)

- A.15.2.5. Noise from construction traffic constitutes a significant effect where the predicted noise impacts are Moderate, Major or Unacceptable.

## Assessment Methodology

- A.15.2.6. Noise levels from off-site construction traffic have been calculated using the calculation methodology set out in Calculation of Road Traffic Noise, Department of Transport, Welsh Office, 1988. Calculations have been carried out for both the base case (i.e. without construction traffic) and the scenario including construction traffic. These cases have been used to determine the change in noise levels due to construction traffic, for comparison with the criteria in **Table 1**.
- A.15.2.7. Levels of noise from on-site construction traffic have been calculated using the haul routes method set out in BS 5228-1. Since no information is available on the precise split of construction traffic on access tracks, calculation have been carried out on the assumption that there could be up to 12 vehicle movements per hour (one every 5 minutes) in a worst-case hour, and that HGV movements would be limited to 10 mph when on site.
- A.15.2.8. Note that it is very unlikely that this flow of construction traffic would occur on any individual access track for a prolonged period of time, therefore predictions of noise due to vehicle movements on internal site access tracks presented in this assessment should be considered conservative.

## Assessment

- A.15.2.9. The change in noise level due to construction traffic on each of the road links identified in the transport assessment has been calculated and is presented in **Table 3** below. These predictions are based on the construction traffic flows as set out in the transport assessment, and included traffic from committed developments.

*Table 3 Change in road traffic noise levels on offsite road links during construction.*

Road Link	Baseline Traffic Flow (2027)		Total with Construction Traffic (2027)		Change in Noise Level
	Flow (AAWT)	% HGV	Flow (AAWT)	% HGV	
A57 West of Dunham	9833	14	10214	16	+0.5
A57 Dunham	9609	12	9659	12	0.0
A57 East of Newton on Trent	9258	10	9293	10	0.0

Road Link	Baseline Traffic Flow (2027)		Total with Construction Traffic (2027)		Change in Noise Level
	Flow (AAWT)	% HGV	Flow (AAWT)	% HGV	
A1133 north of North Clifton	3981	11	4067	12	+0.2
A133 south of South Clifton	4213	45	4415	48	+0.4
Moor Lane	506	20	518	22	+0.4
Roadwood Lane	246	17	258	19	+1.0
Main Street south of Ragnall	1482	23	1522	23	+0.3
Polly Taylor's Road	473	12	486	13	+0.5
Crabtree Lane	71	8	84	16	+3.9

- A.15.2.10. Based on the above results and comparison with the impact criteria given in **Table 5**, the impact of construction noise is expected to be negligible at receptors in the vicinity of all roads except for Roadwood Lane and Crabtree Lane, where the change in noise levels is predicted to result in a minor and moderate impact respectively.
- A.15.2.11. It should be noted that there are no noise sensitive receptors in the study area (i.e. within 50 m of the road) in the vicinity of Crabtree Lane. In addition, construction traffic using Roadwood Lane will only use the northernmost section of that road link, to access the northeastern parts of the Proposed Development. As is the case for Crabtree Lane, there are no properties within 50 m of this part of Roadwood Lane, therefore there are no residential properties that fall within the study area.
- A.15.2.12. As such, the overall impact of construction traffic noise from offsite road links is considered to be negligible. Predicted noise levels from on-site construction traffic are set out in **Table 4** below.



*Table 4 Worst case construction traffic noise levels on access tracks during construction.*

Receptor	Predicted Noise Level (dB LAeq, 1 hour)
Far Hill Farm	59
Station House	65
1 Station Cottage	68
2 Station Cottage	68
The Gables	59
The Chase	68
The Gables Bungalow	61

A.15.2.13. Based on the above results and comparison with the impact criteria in **Table 5**, the impact of noise from on-site construction traffic is expected to be, at worst, minor.

A.15.2.14. Given the relatively low construction traffic flows, the distances between receptors and road links or access tracks that will be used by construction traffic and the fact that all of the identified off-site road links already experience HGV movements, it is very unlikely that construction traffic will lead to any increase in vibration levels at sensitive receptors. As such, vibration impacts due to construction traffic are considered to be negligible.

### Mitigation

A.15.2.15. Given that, at worst, only minor impacts are predicted at the nearest noise sensitive receptors due to construction traffic movements, no specific mitigation measures are required to control noise and vibration from construction traffic. It is, however, recommended that a construction traffic management plan is implemented so, wherever possible, construction traffic is routed away from noise and vibration sensitive properties.

## A.15.3 On-site Construction Activities

### Study Area

A.15.3.1. The study area for the assessment of on-site construction noise is shown in **ES Volume 3, Figure 15.4: Study Areas [EN010159/APP/6.20]**, with the study area for construction vibration effects shown in **ES Volume 3, Figure 15.7: Construction Vibration Study Area and Sensitive Receptors**

**[EN010159/APP/6.20]**. These include all residential properties within 300 m and 150 m of the works areas respectively.

- A.15.3.2. Noise sensitive properties within the construction noise and vibration study areas are also identified in **ES Volume 3, Figure 15.4: Study Areas [EN010159/APP/6.20]** and **ES Volume 3, Figure 15.7: Construction Vibration Study Area and Sensitive Receptors [EN010159/APP/6.20]**.

### Assessment Criteria

- A.15.3.3. The assessment of noise from on-site construction activities has been carried out with reference to the criteria set out in BS 5228:2009+A1:2014, Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1, Noise. The criteria adopted for this assessment are set out in **Table 5** below.

*Table 5 Criteria for magnitude of noise from on-site construction activities, adapted from BS 5228-1.*

Magnitude of Impact	Level of noise from on-site construction traffic (dBA)
Unacceptable	Greater than 85 dB(A)
<i>Unacceptable Adverse Effect Level (UAEL) = 85 dB(A)</i>	
Major	Greater than or equal to 75 dB(A) and less than 85 dB(A)
<i>Significant Observed Adverse Effect Level (SOAEL) = 75 dB(A)</i>	
Moderate	Greater than or equal to 70 dB(A) and less than 75 dB(A)
Minor	Greater than or equal to 65 dB(A) and less than 70 dB(A)
<i>Lowest Observed Adverse Effect Level (LOAEL) = 65 dB(A)</i>	
Negligible	Less than 65 dB(A)

- A.15.3.4. The above magnitudes are considered to apply where the levels of construction noise quoted would be expected to be experienced for 10 days in any consecutive 15-day period, or more than 40 days in a consecutive six-month period. Where the duration of exposure is shorter than these periods, construction noise impacts are considered to be Minor.
- A.15.3.5. Vibration impacts associated with on-site construction activity have been assessed with reference to the criteria set out in BS 5228:2009+A1:2014, Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 2, Vibration. The criteria adopted for this assessment are set out in **Table 6** below.

Table 6 Criteria for magnitude of vibration from on-site construction activities, adapted from BS 5228-2.

Magnitude of Impact	Level of vibration from on-site construction traffic (mm/s)
Unacceptable	Greater than 10 mm/s
<i>Unacceptable Adverse Effect Level (UAEL) = 10 mm/s</i>	
Major	Greater than or equal to 1 mm/s and less than 10 mm/s
<i>Significant Observed Adverse Effect Level (SOAEL) = 1.0 mm/s</i>	
Moderate	Greater than or equal to 0.6 mm/s and less than 1 mm/s
Minor	Greater than or equal to 0.3 mm/s and less than 0.6 mm/s
<i>Lowest Observed Adverse Effect Level (LOAEL) = 0.3 mm/s</i>	
Negligible	Less than 0.3 mm/s

A.15.3.6. BS 5228-2 additionally states that:

*“Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472-1 or -2, and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.”*

A.15.3.7. As such, where vibration exposure is expected to be very short in duration impacts are likely to be lower than those stated in Table 6.

A.15.3.8. Noise or vibration from on-site construction activities constitutes a significant effect where the predicted noise impacts are Moderate, Major or Unacceptable.

### Assessment Methodology - Noise

A.15.3.9. Construction noise predictions have been carried out using the methodology set out in BS 5228-1:2009+A1:2014. Since details of the likely construction plant and equipment are not available at this stage, predictions have been carried out for three different construction activities which are likely to be representative of the worst-case activities on site. These are:

> Trenching for cable installation

- > Piling of solar panel support frames
- > Construction of concrete bases for the BESS and substation compounds
- > Construction of internal site access tracks / works to existing highways.

A.15.3.10. The final plant and equipment selections are not known at this stage, however Table 7 below summarises the items of plant assumed to be in use during each of the four main construction activities, along with the assumed total sound power levels for each activity, derived from the plant noise source data provided in BS 5228-1.

*Table 7 Assumed construction plant and equipment, and source sound power levels derived from BS 5228-1.*

Construction Activity	Plant and equipment assumed	Total Sound Power Level (dB(A))
Trenching	Tracked excavator Wheeled backhoe loader	105
Piling	Hydraulic hammer rig for tubular steel piling Tracked excavator	113
Construction of BESS / substation foundations	Wheeled excavator x 2 Articulated dump truck Concrete pump and cement truck	110
Construction of internal site tracks / highways works	Dozer Wheeled excavator Articulated dump truck Vibratory roller	110

A.15.3.11. As a worst-case assumption, predictions have been carried out at the closest point to the noise sensitive receptors that work could feasibly take place.

### Assessment - Noise

A.15.3.12. The noise sensitive receptors that are identified as experiencing greater than a negligible effect during worst-case periods of each of the four construction activities are set out in the following sections.

#### Trenching

A.15.3.13. Sensitive receptors that are predicted to experience noise effects greater than negligible due to trenching works are shown in **Table 8** below.

*Table 8 Sensitive receptors predicted to experience greater than negligible noise impacts during trenching*

Receptor	Predicted Noise Level (dB(A))	Magnitude of Impact
1 Skegby House Cottage, Skegby	65	Minor
2 Skegby House Cottage, Skegby	65	Minor
Wheatholme Farm, Main Road, South Clifton	66	Minor
1 Long Row, Fledborough	65	Minor
Northfield Farm, Northfield Lane, North Clifton	70	<b>Moderate</b>

A.15.3.14. As can be seen above, only Northfield Farm is predicted to experience a noise impact of Moderate or greater. It should be noted that these predictions do not include any noise mitigation and assume that trenching work takes place at the nearest possible location to each receptor. These predictions should therefore be taken to represent the worst case noise level during trenching works, and these noise levels would only be experienced when trenching is taking place at the closest point to each respective property. This is likely to be a very limited duration (i.e. a small number of days), therefore as per the assessment criteria described in section 0 of this Appendix, these noise impacts would be considered Minor due to the limited duration of impact. Potential noise mitigation measures are discussed in section 0 of this Appendix.

### Piling

A.15.3.15. Table 9 below sets out the sensitive receptors at which noise from piling is predicted to result in a greater than negligible noise impact.

*Table 9 Sensitive receptors predicted to experience greater than negligible noise impacts during piling*

Receptor	Predicted Noise Level (dB(A))	Magnitude of Impact
2 Skegby House Cottage, Skegby	73	<b>Moderate</b>

Receptor	Predicted Noise Level (dB(A))	Magnitude of Impact
Field House Farm, Dunham Road, Darlton	70	<b>Moderate</b>
1 Skegby House Cottage, Skegby	74	<b>Moderate</b>
Vicarage Farm, Farhill Lane, Ragnall	67	Minor
Fledborough House, Fledborough	66	Minor
Wheatholme Farm, Main Road, South Clifton	74	<b>Moderate</b>
1 Long Row, Fledborough	73	<b>Moderate</b>
The Chase, Main Road, South Clifton	72	<b>Moderate</b>
3 Long Row, Fledborough	70	<b>Moderate</b>
Station House, Gainsborough Road, North Clifton	66	Minor
2 Long Row, Fledborough	72	<b>Moderate</b>
4 Long Row, Fledborough	69	Minor
Mill Farm Cottage, Mill Lane, North Clifton	69	Minor
House Farm, Fledborough	68	Minor
The Station, Gainsborough Road, North Clifton	67	Minor
Northfield Farm, Northfield Lane, North Clifton	79	<b>Major</b>

Receptor	Predicted Noise Level (dB(A))	Magnitude of Impact
Hall Farmyard, Gainsborough Road, North Clifton	66	Minor
2 Park Farm Cottages, Park Farm Road, Kettlethorpe	66	Minor
3 Park Farm Cottages, Park Farm Road, Kettlethorpe	66	Minor
1 Park Farm Cottages, Park Farm Road, Kettlethorpe	71	<b>Moderate</b>
Birchlands Farm, Newton Road, Kettlethorpe	67	Minor

A.15.3.16. As can be seen from the above, there are nine properties that are predicted to experience a Moderate noise impact during piling, with one property (Northfield Farm) predicted to experience a Major noise impact during piling. It should be noted that these predictions do not include any mitigation measures and assume impact piling (i.e. the form of piling that generates the highest noise levels) and assume piling works are taking place at the shortest possible distance from the property. Piling works would only take place at these distances for a very limited period of time (i.e. when the nearest pile is being installed) and piling activities would only take place in any one part of the site for a limited duration, during the initial installation of the panel frames. As such, given the likely limited duration of the noise impact, the criteria set out in section 0 of this Appendix would indicate that the overall noise impact would be reduced to Minor in all cases. Potential noise mitigation measures are discussed in section 0 of this Appendix.

#### Access Track Construction

A.15.3.17. Predicted noise impacts during construction of access tracks / highways works are set out in **Table 10**, for receptors predicted to experience impacts greater than Negligible.

*Table 10 Sensitive receptors predicted to experience greater than negligible noise impacts during construction of access tracks/ highways works*

Receptor	Predicted Noise Level (dB(A))	Magnitude of Impact
Far Hill Farm, Farhill Lane, Ragnall	66	Minor
Station House, Fledborough	93	<b>Unacceptable</b>
1 Station Cottage, Fledborough	95	<b>Unacceptable</b>
2 Station Cottage, Fledborough	91	<b>Unacceptable</b>
The Chase, Main Road, South Clifton	93	<b>Unacceptable</b>
The Gables Bungalow, Fledborough	71	Minor

A.15.3.18. As can be seen from the above, there are four receptors which are predicted to experience Unacceptable impacts. It should be noted that all of these receptors that are predicted to experience high noise levels are very close to highways works areas (i.e. within 15 to 20 m). Road works at these distances to receptors would only be expected to take place for very limited durations (i.e. a small number of days), similar to, for instance, typical road works. Given the short duration of exposure, and with reference to the assessment criteria set out in section 0 of this Appendix, noise impacts would be reduced to Minor at all receptors. The above assessment does, however, indicate that very high noise levels could be experienced at a limited number of receptor locations without mitigation (albeit for a very limited duration). As such, mitigation measures are discussed in section 0 of this Appendix.

### BESS and Substation Construction

A.15.3.19. Predictions have been carried out to identify properties that could experience greater than negligible noise impacts due to the construction of the BESS and substation foundations. Due to the separation distances between the BESS and substation compounds and the nearest receptors (not less than 300 m for any receptor), there are no properties that are predicted to experience greater than a negligible impact during the construction of the BESS and substation bases.

A.15.3.20. Based on the above, the overall impact of construction noise is expected to be, at worst, Minor.



## Assessment Methodology – Vibration

### Assessment - Vibration

- A.15.3.21. Construction activities that have the potential to generate significant levels of vibration at nearby sensitive receptors include piling and the construction of access tracks. The shortest distance to any receptor at which piling may occur is approximately 25 m (Northfield Farm). Reference to Annex D of BS 5228-2 indicates that, for impact bored piling, vibration levels would typically be expected to be of the order of 0.1 to 0.6 mm/s. Reference to the criteria set out in **Table 6** indicates that, at worst, this would equate to a moderate impact. It should be noted that this is an absolute worst case, as it assumes a piling method (impact piling) that generates high source levels of vibration and considers the minimum possible distance at which piling could occur from a sensitive receptor. As such, this impact, if it occurred, would only occur for a very brief period of time (i.e. during the installation of a single pile, likely a matter of hours). Vibration effects of piling for the remainder of construction would be negligible to minor.
- A.15.3.22. Levels of vibration from access track construction and highways works have been calculated using the prediction methodology set out in Annex E of BS 5228-2. Receptors that are predicted to experience a greater than negligible vibration impact due to construction of temporary access tracks are shown in **Table 11** below.

*Table 11 Sensitive receptors predicted to experience greater than negligible vibration impacts during construction of access tracks / highways works*

Receptor	Predicted Vibration Level (mm/s PPV)	Magnitude of Impact
Station House, Fledborough	1.7	Major
1 Station Cottage, Fledborough	2.2	Major
2 Station Cottage, Fledborough	1.1	Major
The Chase, Main Road, South Clifton	1.7	Major

- A.15.3.23. All of the above receptors are very close to locations of highways works (within 15 to 20 m). As is the case for the assessment of noise from highways works, the above assessment assumes construction activities (and in particular vibratory compaction) are taking place at the nearest position of the works to the receptor, and as such represent a worst case. Activities would only take place at these locations for a very limited duration (e.g. a small number of

days) and would be similar in nature to typical road works. The impact of the levels of vibration predicted is therefore expected to be Minor.

- A.15.3.24. As such, the overall impact of vibration due to on-site construction plant and equipment is considered to be Minor.

### **Mitigation**

- A.15.3.25. As has been identified in the previous section, given the limited duration of works that have the potential to generate noise or vibration impacts at receptor locations, no impacts greater than Minor are predicted, therefore no specific mitigation measures are required in order to avoid significant noise / vibration effects.
- A.15.3.26. It should, however, be noted that relatively high levels of noise and vibration may be generated at sensitive receptors for a very limited duration. As such, the following mitigation measures should be implemented, particularly where construction works will take place close to residential properties:
- > Where flexibility exists, construction plant and equipment should be situated away from sensitive receptors while in operation.
  - > Where possible, quieter / lower vibration plant and construction methods should be used. For instance, piling is currently assumed to utilise impact piling as a worst case, however quieter methods (e.g. CFA piling) may be feasible in some areas of the site.
  - > Site hoardings should be used to screen construction activities, particularly where construction works are needed in close vicinity to residential properties.
  - > Where specific items of plant are required that generate high levels of noise and / or vibration, localised screening of those specific items of plant should be implemented wherever possible.
  - > All plant and equipment should be kept in good working order and operated with all manufacturer recommended noise control measures (e.g. enclosures, silencers, attenuators etc.) installed and functional.
- A.15.3.27. The above mitigation measures would be expected to reduce noise levels at noise sensitive receptors by 5 to 10 dB.
- A.15.3.28. A Construction Environmental Management Plan is being developed as part of the application which will include consideration of measures to reduce noise and vibration during construction.

## A.15.4 HDD Operations

### Study Area

- A.15.4.1. Horizontal Directional Drilling (HDD) operations will only take place as part of the works to install the cable across the River Trent. The river crossing point is to the west of North Clifton / east of Fledborough. The precise locations for the HDD compounds have not yet been precisely determined, however the compounds are likely to be close to the river to minimise the distance needed for the bores. As such, the sensitive receptors that have the potential to be affected by noise from the HDD works are the north eastern properties in Fledborough and the north western properties in North Clifton.

### Assessment Criteria

- A.15.4.2. Assessment criteria for the assessment of construction noise from HDD works have been derived based on the guidance set out in BS 5228-1. It should be noted that there is the possibility that evening or night-time operations may be required for the HDD works. This is due to the fact that, once drilling of a bore has started, the bore must be completed or there is a risk that the drill will become stuck.
- A.15.4.3. As such, the criteria set out below are based on the assumption that that work will take place at night, as a worst case.

Table 12 Criteria for magnitude of noise from HDD activities, adapted from BS 5228-1.

Magnitude of Impact	Level of noise from on-site construction traffic (dBA)
Unacceptable	Greater than 65 dB(A)
<i>Unacceptable Adverse Effect Level (UAEL) = 65 dB(A)</i>	
Major	Greater than or equal to 55 dB(A) and less than 65 dB(A)
<i>Significant Observed Adverse Effect Level (SOAEL) = 55 dB(A)</i>	
Moderate	Greater than or equal to 50 dB(A) and less than 55 dB(A)
Minor	Greater than or equal to 45 dB(A) and less than 50 dB(A)
<i>Lowest Observed Adverse Effect Level (LOAEL) = 45 dB(A)</i>	
Negligible	Less than 45 dB(A)

## Assessment Methodology

- A.15.4.4. Predictions of noise impacts due to HDD works have been carried out with reference to the methodology set out in BS 5228-1. Whilst the precise locations of the HDD compounds have not yet been established, approximate source locations have been assumed to be at around 300 m from the properties in the northeast of Fledborough (The Old Vicarage and Rectory Cottage), and approximately 400 m from the properties to the north west of North Clifton (Meadow View, Trentholme Farm, Holmelea and Dormer House). These distances are considered to be representative of the likely minimum distances to these properties at which HDD works could take place.
- A.15.4.5. The precise details of the plant and equipment that would be required during HDD works are not known at this stage, however the following plant and equipment has been assumed, based on the noise source information provided in BS 5228-1.

*Table 13 Assumed construction plant and equipment, and source sound power levels derived from BS 5228-1.*

Construction Activity	Plant and equipment assumed	Total Sound Power Level (dB(A))
HDD Works	Drilling rig Directional drilling generator (106 kW) Water pump, 20 kW Diesel generator for lighting	107

## Assessment

- A.15.4.6. The following table sets out the predicted noise levels from HDD works at the identified sensitive receptors.

*Table 14 Predicted worst-case noise impacts from HDD works*

Receptor	Predicted Noise Level (dB(A))	Magnitude of Impact
Meadow View, Trent Lane, North Clifton	42	Negligible
Trentholme Farm, Back Lane, North Clifton	41	Negligible
Holmelea, Trent Lane, North Clifton	41	Negligible
Dormer House, Trent Lane, North Clifton	42	Negligible

Receptor	Predicted Noise Level (dB(A))	Magnitude of Impact
The Old Vicarage, Fledborough	47	Minor
Rectory Cottage, Fledborough	46	Minor

A.15.4.7. As such, the worst-case noise impact due to HDD works is anticipated to be, at worst, Minor.

### Mitigation

A.15.4.8. Given that noise impacts from HDD works are expected to be, at worst, Minor, there is no need for specific noise mitigation measures. The following good practice measures should, however, be implemented wherever practicable to minimise noise impacts as far as possible:

- > Where flexibility exists, construction plant and equipment should be situated away from sensitive receptors while in operation.
- > Where possible, low noise plant and equipment should be utilised.
- > Site hoardings should be used to screen construction activities from residential properties.
- > All plant and equipment should be kept in good working order and operated with all manufacturer recommended noise control measures (e.g. enclosures, silencers, attenuators etc.) installed and functional.



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