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TECHNICAL NOTE

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1.0 Introduction

Martec prepared a noise assessment report for the residential development of a site at Malting Lane, Donington, Spalding, PE11 4XA [Martec Ref. 20160208 7526 Donington BS8233]; with the main noise source lying to the **west** of the site, the recommendations of our report were largely to the properties close to the **western** boundary of the site.

Outline planning consent for approximately 73 dwellings was granted by South Holland DC for the site [SHDC Ref. H04-0244-16]; our report formed part of the application and consent was granted subject to the following 'noise' condition:

"14 Before the commencement of the development hereby permitted, a noise and vibration report prepared by a suitably qualified consultant shall be submitted to and approved in writing by the Local Planning Authority. This report shall identify any measures or works necessary to ensure that there is no possible nuisance caused to the proposed residential properties from

Loughborough Office:

8 Bayliss Close, Quorn, Loughborough LE12 8PF

Staffordshire / Cheshire Office:

2, Betley Hall Gardens, Betley, Crewe CW39BB

Ormskirk Office:

131 New Court Way, Ormskirk, Lancs L39 2YT



noise or vibration.”

It is understood that the development will take place in phases, with the **eastern** section of the site being first [Phase 1], and an application has been made for development of the **eastern** section of the site [SHDC Ref.H04-0268-20].

This Technical Note updates the recommendations of our original report, based on the assumptions that eastern Phase 1 may not be followed by development of the western section of the site, and that the noise climate has not significantly altered since the preparation of original report.

This Technical Note should be read in conjunction with our original report which is available on the local authority's planning portal if required.

2.0 Results of Original Study

Figure 1 below shows the boundaries of the current [Phase 1] section of the site as a solid red outline, with the approximate [lesser] area of residential development shown in yellow, i.e., the area containing gardens and houses. The two original measurement locations [Nos 1 & 2] are also indicated.

The week-long monitoring at both locations is described in greater detail in our original report; however, the background noise measurements at position 2 were used to represent background noise across the site as a whole.

Position 1 was closer to the main noise source affecting the site, which is a haulage facility at Station Yard, immediately to the west of the site and operated

by Turners (Soham) Ltd. Position 1 is some 10m from the site boundary, and some 25m from the nominal centre of the loading/unloading area of the haulage yard.

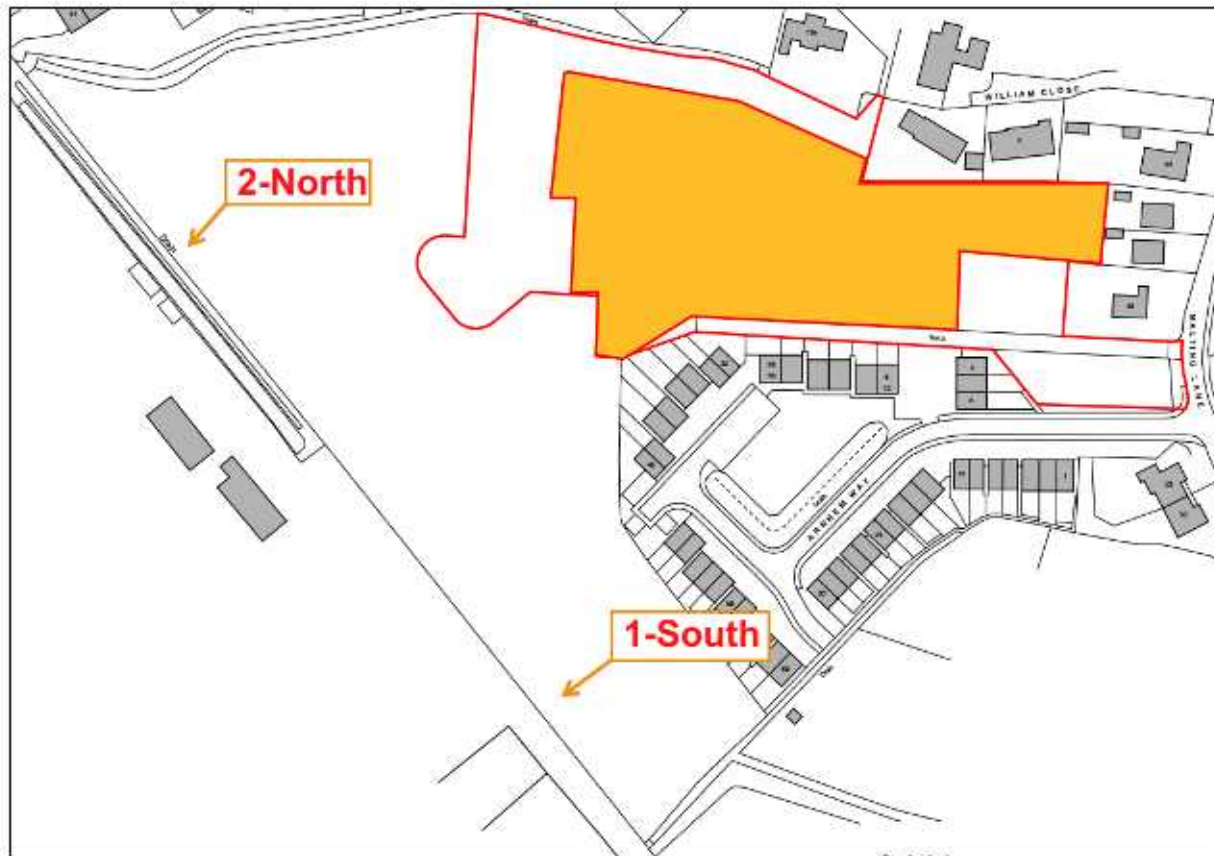


Figure 1: Site Location Plan

In Section 5.2.1 of the original report, the representative backgrounds were established as 44, 41 and 39 LA90 for daytime, evening and night respectively; similarly in Section 5.2.2 of that report, the representative source noise levels [specific noise from the haulage yard] were established as 59, 61 and 55 LAeq,1hr for the southern monitoring position [No.1] for daytime, evening and night respectively.

With regard to the period noise levels, again for Position 1 [south] the

representative levels were 53 LAeq,16hr [day] and 46 LAeq,8hr [night]. With typical nighttime maxima of 63 L_{Amax},F.

3.0 Noise Levels in Phase 1 [Eastern Section of Site]

The nearest rear garden in Phase 1 would be at least 110m from the centre of the loading area, compared with the 25m separation distance of Monitoring Position No.1 [south]. In addition, we have assumed that the rear gardens would be protected by a 2.1m high acoustic fence [See Appendix 3 for Specification]. Table 1 below shows the predicted evening noise levels in the nearest rear gardens on the same basis as previously [cf. Figure 7 of original report].

BS5228 SWL Method			Octave Band Centre Frequency [Hz]					dBA	
Version	1.6		SWL Spectrum						
© 2015 Martec Environmental Consultants Ltd			Shape (dBLin)						
BS5228-1:2009 Predictions			Adjustment to a Given Level						
Element	Height	Dist from Source							
Sound Power Level	2.0		96.6	93.0	92.8	93.9	89.9	97.0	
Attenuations								Attenuation	
Receiver [distance correction]	1.5	110.0	48.8	48.8	48.8	48.8	48.8	48.8	
Proportion of Soft Ground & HPR	1.0	1.8	3.2	3.2	3.2	3.2	3.2	3.2	
Barrier Attenuation	2.1	105.0	5.6	6.1	7.0	8.6	10.9	8.5	
Traverse Length	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Percentage on Time	100.0		0.0	0.0	0.0	0.0	0.0	0.0	
Percentage in Use	100.0		0.0	0.0	0.0	0.0	0.0	0.0	
Façade Reflection	0.0		0.0	0.0	0.0	0.0	0.0		
Predicted Level at Reciever			External SPL/dBLin	42.2	38.1	36.9	36.4	30.2	39.7

Table 1: Predicted Evening 'Haulage Yard' Noise Levels in Nearest Rear Garden [LAeq,1hr]

With the bedrooms on the first floor, the acoustic barrier would be less effective,

as shown in Table 2 below

BSS228 SWL Method		Octave Band Centre Frequency [Hz]					dBA
Version	1.6	SWL Spectrum					
© 2015 Martec Environmental Consultants Ltd		125	250	500	1000	2000	
BSS228-1:2009 Predictions		50.2	46.6	46.4	47.5	43.5	50.6
		Adjustment to a Given Level					97.0
Element	Height	Dist from Source					
Sound Power Level	2.0		96.6	93.0	92.8	93.9	89.9
Attenuations							
Receiver [distance correction]	4.0	110.0	48.8	48.8	48.8	48.8	48.8
Proportion of Soft Ground & HPR	1.0	3.0	2.1	2.1	2.1	2.1	2.1
Barrier Attenuation	2.1	105.0	-0.1	0.0	0.0	0.0	0.0
Traverse Length	0.0		0.0	0.0	0.0	0.0	0.0
Percentage on Time	100.0		0.0	0.0	0.0	0.0	0.0
Percentage in Use	100.0		0.0	0.0	0.0	0.0	0.0
Façade Reflection	0.0		0.0	0.0	0.0	0.0	0.0
Predicted Level at Reciever	External SPL/dBlin		45.6	42.0	41.8	42.9	38.9
							46.1

Table 2: Predicted Evening 'Haulage Yard' Noise Levels at First-Floor Level [LAeq,1hr]

Using the above, the Predicted Noise Levels can be summarised as shown in Table 3 below:

Factor	Position 1	Nearest Garden	Nearest 1 st Floor
Daytime Background [LA90]	44		
Evening Background [LA90]	42		
Daytime Haulage Yard [LAeq,1hr]	59	38	44
Evening Haulage Yard [LAeq,1hr]	61	40	46
Daytime Period [LAeq,16hr]	56	35	41
Nighttime Period [LAeq,8hr]	47	26	32
Nighttime Maxima [LAmx,F]	63	42	48

Table 3: Derived/Predicted Noise Levels

4.0 Discussion of Property Noise Levels

Again, the following discussion has been undertaken on the same basis as our original report. Please note that full details of the assessment criteria used also appear in that report.

4.1 Internal Period Noise Levels – BS8233.

British Standard 8233:2014 and several other similar documents all indicate that the difference between internal and external noise levels should be taken as 15dBA no matter the room size or window area; therefore Table 4 below assesses internal level, using the external levels in Table 3 for the more affected first floor of the nearest dwellings.

Condition	Day LAeq,16hr	Night LAeq,8hr	Night LAmax,F
External Level	41	32	48
Open Window Attenuation		-15	
Internal Level	26	17	33
BS8233 Criterion	35	30	45
Exceedance	-9	-13	-12
Criteria Met?	Yes	Yes	Yes

Table 4: Assessment of First Floor Levels

Table 4 shows the relevant criteria being met for the first floor, naturally the criteria would also be met on the less affected ground floor of the dwellings.

4.2 External Daytime Period Noise Level

Firstly, it should be pointed out neither the latest government guidance nor BS8233:2014 consider that garden noise levels should be overriding planning considerations.

With regard to private [rear] gardens, the predicted daytime noise levels were 35 LAeq,16hr and these met the daytime criterion of 55 LAeq,16hr from BS8233:2014.

4.3 External Levels - BS4142

An indicative evening BS4142 assessment would be as per the Table 5 below, which assumes that there are "Clearly perceptible" tonal elements to the noise [reversing beepers], and some impulsive characteristics; this means that the "other" character correction is not applicable; there is no correction for intermittency because the measurement period [1 hour by day] is the same as the reference period.

Condition	Day	Evening
Measured/Predicted Ambient Level	36.7	39.7
Residual Level	0	0
Specific Noise Level	37	40
Tonal Correction	+4	+4
Impulsive Character	+3	+3
Other Character	0	0
Intermittancy	0	0
Rating Level [Specific + Character Correction]	44	47
Background Noise Level LA90	44	42
Excess over Background	0	5

Table 5: Indicative BS4142:2014 Assessments for Rear Gardens

For the predicted daytime and evening haulage yard rating levels, there is less than an indication of significant adverse impact depending on the context.

Given that facade insulation treatment is being proposed for the new properties

along with appropriate ventilation, and acoustic screening, nighttime noise has been assessed as per BS8233 above.

5.0 Conclusion and Recommendations

5.1 This Technical Note updates our original noise assessment [Martec Ref. 20160208 7526 Donington BS8233] for Phase 1 of the development site off Malting Lane.

5.2 The results of the original study showed that haulage yard activities result in periods of higher noise levels, particularly during late afternoons, and evenings which could potentially cause complaints from nearby residents.

5.3 In order to reduce the impact on Phase 1 residents, it is recommended that 2.1m high acoustic fences should be built around the rear gardens of the nearest properties [shown as a blue dashed line in Appendix 4 – from JGA Drawing 19020/0102/P11].

5.4 Habitable rooms in the closest properties with views towards the haulage yard should be fitted with standard thermal glazing and acoustic vents such as Passivent TVALdB 450 or similar and approved [The relevant facades are marked with red stars in Appendix 4].

5.5 Any rooms fitted with acoustic vents, should also be fitted with a Mechanical Extract Ventilation (MEV) or a Passive Input Ventilation (PIV) system which extracts/supplies air from the habitable rooms, but which does not allow

significant noise to enter from the outside, either because of the system's attenuation or because it vents to a quiet façade. Residents could then occupy the properties without the need to open windows.

5.6 The above assessment indicates that with the above package of noise control measures, internal and external levels would comply with the recommended design criteria from BS8233. Furthermore, even during times where there are periods of higher activity at the Haulage Yard (such as Christmas), when the haulage yard daytime/evening operations could occur at night, the internal and external levels would comply with the recommended design criteria from BS8233.

5.7 Predictions based on the measured levels of existing noise indicate that for daytime and evening noise levels there is no indication of significant adverse impact on the proposed development as defined by BS4142:2014.

APPENDIX 1

EXPLANATION OF ACOUSTIC TERMS

The dB or the decibel, is the unit of noise. The number of decibels or the level, is measured using a sound level meter. It is common for the sound level meter to filter or 'weight' the incoming sound so as to mimic the frequency response of the human ear. Such measurements are designated **dB(A)**.

A doubling of the sound is perceived, by most people, when the level has increased by 10 dB(A). The least discernible difference is 2 dB(A). Thus, most people cannot distinguish between, say 30 and 31 dB(A).

The Background level of noise is most commonly represented by the level which is exceeded for 90% of the time i.e., the LA90.

If a noise varies over time, then the **equivalent continuous level, or LAeq**, is the notional constant level of noise which would contain the same amount of acoustic energy as the time varying noise.

The following table gives an approximate indication of the comparative loudness of various noises expressed in terms of the A weighted scale:

Source of noise	dB(A)	Nature of Noise
Inside Quiet bedroom at night	25-30	Very Quiet
Quiet office	40-45	
Rural background noise	35-45	
Normal conversational level	55-65	
Busy restaurant	65-75	
Inside suburban electric train	70-80	
Hand clap @ 1m	75-85	
HGV accelerating @ 5m away	85-90	Very Loud

APPENDIX 2

QUALIFICATIONS AND EXPERIENCE OF M. A. KENYON

My full name is Melville Alexander Kenyon. I am the principal of the firm of Martec Environmental Consultants Ltd, a consultancy company that specialises in environmental noise assessment and control. I graduated in 1982 with a bachelor's degree in Engineering and subsequently a master's degree in Environmental Acoustics. I have been a corporate member of the professional body for noise and vibration specialists, the Institute of Acoustics, since 1988, and have sat on the British Standards Committee dealing with noise in buildings [BS.8233:1999].

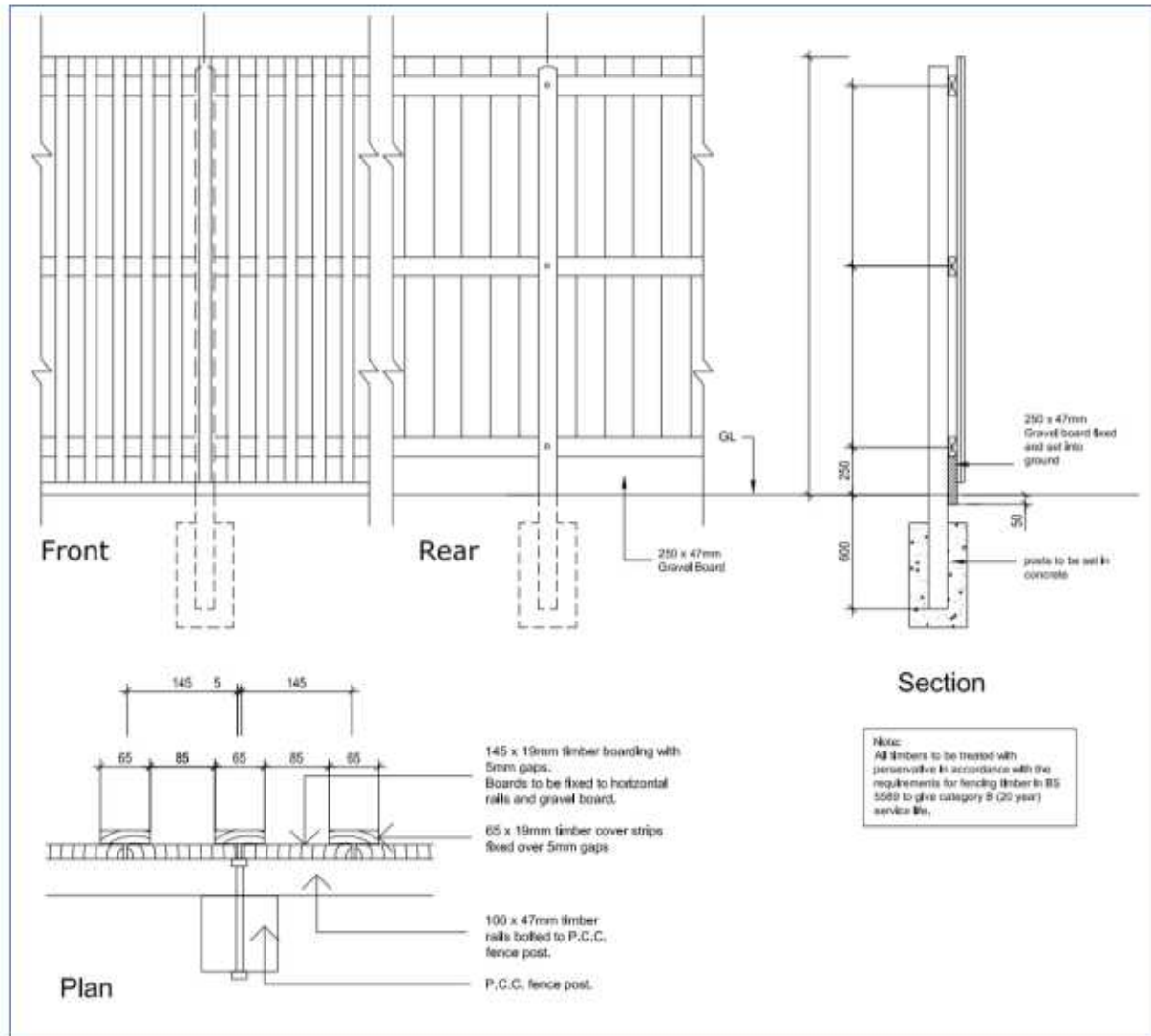
I have lectured at Liverpool John Moores University on the Diploma of Acoustics course and at Manchester Metropolitan University on their Environmental Health degree course.

The firm of Martec Environmental Engineering was formed in the 1970's and joined The Association of Noise Consultants in 1996. It is now known as Martec Environmental Consultants Ltd.

Since its formation, Martec has advised many groups of both residents and developers about the problems of noise and vibration in the environment.

APPENDIX 3

ACOUSTIC FENCE DETAIL



APPENDIX 4

Illustrative Masterplan [2.1m Acoustic Fence - Blue dashed line, Acoustic Ventilation – Red Star]

