



Humber Low Carbon Pipelines

Preliminary Environmental Information Report
Volume III Appendix 12.2 Noise and Vibration
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Appendix 12.2: Construction Phase Assessment Criteria

Construction Noise

BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Noise' (BS 5228-1) gives recommendations for basic methods of noise control relating to construction work. It also provides guidance concerning methods of predicting and measuring construction noise and assessing its impact on those exposed to it.

Table E.1 of BS 5228-1 provides a methodology for determining significant noise levels due to construction activities. For the appropriate period (daytime, evening/weekends or night-time), the pre-construction ambient noise level is determined, rounded to the nearest 5 dB and then allocated into a threshold category (A to C).

The predicted construction noise levels are assessed against the corresponding noise threshold level. If the construction noise level exceeds the appropriate category value, then a potential significant impact may be considered to occur. Table E.1 of BS 5228-1 is reproduced below.

Table A12-2.1: Threshold of potential significant construction impacts at dwellings

Assessment category and threshold value period	Threshold value, in decibels (dB) ($L_{Aeq,T}$)		
	Category A ^{A)}	Category B ^{B)}	Category C ^{C)}
Night-time (23.00-07.00)	45	50	55
Evenings (19.00-23.00) and weekends	55	60	65
Daytime (07.00-19.00) and Saturdays (07.00-13.00)	65	70	75
<p><i>NOTE 1 - A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.</i></p> <p><i>NOTE 2 - If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.</i></p> <p><i>NOTE 3 - Applied to residential receptors only.</i></p>			
<p>^{A)} Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.</p> <p>^{B)} Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values.</p>			

^{C)} Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values.

If the contractor has applied best practicable means to the provision of mitigation, i.e. all reasonable measures have been taken to reduce the noise levels, but levels are still such that widespread community disturbance or interference with activities or sleep is likely to occur, there are further provisions that can be made if the construction activities are likely to continue for a significant period of time either continuously or sporadically. These are noted to be noise insulation and temporary or permanent re-housing. BS 5228-1 provides an example of thresholds used to determine eligibility for these measures within Annex E.4, which are summarised below.

Table A12-2.2: Noise thresholds for noise insulation/temporary re-housing

Time	Relevant time period	Averaging time, T	Noise insulation trigger level dB $L_{Aeq,T}$ ^{A)}	Temporary re-housing trigger level dB $L_{Aeq,T}$ ^{A)}
Monday to Fridays	07.00 – 08.00	1 hour	70	80
	08.00 – 18.00	10 hours	75	85
	18.00 – 19.00	1 hour	70	80
	19.00 – 22.00	3 hours	65	75
	22.00 – 07.00	1 hour	55	65
Saturday	07.00 – 08.00	1 hour	70	80
	08.00 – 13.00	5 hours	75	85
	13.00 – 14.00	1 hour	70	80
	14.00 – 22.00	3 hours	65	75
	22.00 – 07.00	1 hour	55	65
Sundays & Public Holidays	07.00 – 21.00	1 hour	65	75
	21.00 – 07.00	1 hour	55	65

^{A)} All noise levels are predicted or measured at a point 1 m in front of the most exposed of any windows and doors in any façade of any eligible dwelling.

Qualifying eligibility criteria

Noise levels are predicted or measured by the contractor to exceed the relevant trigger level defined above at that property for at least 10 days out of any period of 15 consecutive days, or at least 40 days in any six-month period.

Construction Vibration

BS 5228-2:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Vibration' (BS 5228-2) provides guidance on vibration levels that can be used to assess the likely impacts of construction activities. Annex E of the standard gives empirical formulae for the prediction of the resultant peak particle velocity (PPV) vibration levels for various types of work.

Annex B of the standard gives guidance on the significance of vibration effects in terms of human response to vibration (Table A12-2.3 refers) and structural response to vibration (Table A12-2.4 refers).

Table A12-2.3: Guidance on effects of vibration levels perceptible to humans

Vibration level (PPV)	Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration
0.3 mm/s	Vibration might be just perceptible in residential environments
1.0 mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents
10 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level

Table A12-2.4: Transient vibration guide values for cosmetic damage in structures

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
Industrial and heavy commercial buildings		
Unreinforced or light framed structures	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
Residential or light commercial buildings		

BS 5228-2 states that the guide values in Table A12-2.4 predominantly relates to transient vibration which does not give rise to resonant responses in structures, and to low-rise buildings. Where the dynamic loading caused by continuous vibration is such that it gives rise to dynamic

magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in Table A12-2.4 might need to be reduced by up to 50%.

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