

## Appendix 14.C Typical Mitigation Measures and Associated Sound Reduction Levels

The mitigation options below are presented in BS5228-1 and may or may not represent options appropriate for the construction methods and/ or plant to be used by the Contractor. The mitigation set out below presents best practice options available to the Contractor.

Plant	Noise reduction of plant			Alternative plant
	Source of noise	Possible mitigation (to be discussed with machine manufacturers)	A-weighted sound reduction (dB)	
<b>Hammer drive piling equipment</b>	Pneumatic/diesel hammer or steam winch vibrator driver	Enclose hammer head and top of pile in acoustic screen	5 to 10 dB	Bored piling Vibratory system
	Sheet pile	Acoustically dampen sheet steel piles to reduce levels of resonant vibration		Drop hammer completely enclosed in box with opening at top for crane access
	Impact on pile	Use resilient pad (dolly) between pile and hammer head. Packing needs to be kept in good condition		Steel jacket completely enclosing drop hammer with dolly and polystyrene chips fed to impact surface to dissipate energy
	Cranes cables, pile guides and attachments	Careful alignment of pile and rig		Pressed-in piling which generates its driving force from the frictional restraint of other piles
	Power units or base machines	Fix more efficient sound reduction equipment or exhaust. Acoustically dampen panels and covers. When intended by the manufacturer, engine panels need to be kept closed. Use acoustic screens when possible	5 to 10 dB	
<b>Earth-moving plant bulldozer compactor crane dump truck dumper excavator grader loader</b>	Engine	Fit more efficient exhaust sound reduction equipment. Manufacturers' enclosure panels need to be kept closed	5 to 10	Alternative super silenced plant might be available. Consult manufacturers for details

Plant	Noise reduction of plant			Alternative plant
	Source of noise	Possible mitigation (to be discussed with machine manufacturers)	A-weighted sound reduction (dB)	
scraper				
<b>Compressors and generators</b>	Engine	Fit more efficient sound reduction equipment	Up to 10	Super silenced plant is available.
	Compressor or generator body shell	Acoustically dampen metal casing		Electric-powered compressors are available
		Manufacturers' enclosure panels need to be kept enclosed		Sound-reduced compressor or can be used to supply several items of plant. Use centralised generator system
	Tool	Fit suitably designed muffler or sound reduction equipment to reduce noise without impairing machine efficiency	Up to 15	Hydraulic and electric tools are available
		Ensure all leaks in air line are sealed		Thermic lance
	Bit	Use dampened bit to eliminate ringing		For large areas of concrete, machine designed to break concrete in bending can be used
	Total machine	Erect acoustic screen between compressor or generator and noise sensitive area. When possible, line of sight between top of machine and reception point needs to be obscured	Up to 10	
		Enclose breaker or rock drill in portable or fixed acoustic enclosure with suitable ventilation		
<b>Rotary drills, diamond drilling and boring</b>	Drive motor and bit	Use machine inside acoustic shed with adequate ventilation	Up to 15	Thermic lance
<b>Pumps</b>	Engine pulsing	Use machine inside acoustic enclosure with allowance for engine cooling and exhaust	Up to 20	
<b>Material handling</b>	Impact of material	Do not drop materials from excessive heights. Screen dropping zones, especially on conveyor	Up to 15	

Plant	Noise reduction of plant			Alternative plant
	Source of noise	Possible mitigation (to be discussed with machine manufacturers)	A-weighted sound reduction (dB)	
		systems. Line chutes and dump trucks with a resilient material		