

**Construction Table 1: Established alternative processes to avoid/reduce use of vibrating equipment**

Activity or process	Example vibration magnitude (m/s <sup>2</sup> )	Corresponding time to reach:		Alternative methods	Further information (links on HSE website)
		EAV	ELV		
<u>Tunnelling</u> by hand with clay spade or jigger pick.	16 (typical)	10 m	45 m	Mechanised tunnelling methods, to eliminate hand digging. This is expected for all but the smallest tunnelling jobs.	British Tunnelling Society code of practice on hand-arm vibration  Tunnelling and Pipejacking: Guidance for Designers
<u>Breaking</u> concrete, asphalt, etc. with hand-operated breakers in ground work, road maintenance, etc.	5 (lowest) 12 (typical) 20 (highest)	2 h 20 m 10 m	8 h 90 min 30 min	Plan construction work (e.g. casting-in ducts, detail box-outs) to minimise breaking through new concrete/masonry.  Use alternative method/equipment as appropriate: <ul style="list-style-type: none"> <li>• machine-mounted hydraulic breakers</li> <li>• floor saws</li> <li>• directional drilling/pipe jacking to avoid trenching</li> <li>• hydraulic crushers</li> <li>• hydraulic bursters</li> <li>• diamond core drilling</li> <li>• diamond wire cutting</li> <li>• hydro-demolition (UHP water jetting)</li> </ul>	Construction Industry Council guidance  Example: mounted breaker  Example: directional drilling Example: crushing concrete Example: Bursting concrete  Example: diamond wire cutting Example: water jetting Codes of Practice from the Waterjetting Association
<u>Demolition</u> of concrete/masonry using hand-held hammers/breakers	8 (lowest) 15 (typical) 25 (highest)	45 m 15 m 5 m	3 h 1 h 20 m		
<u>Pile cropping</u> using hand-held hammers/breakers	8 (lowest) 15 (typical) 25 (highest)	45 m 15 m 5 m	3 h 1 h 20 m	Pile cap removal using hand-operated breakers is <b>not acceptable</b> . Use alternative method as appropriate: <ul style="list-style-type: none"> <li>• Elliott method</li> <li>• Recipieux method</li> <li>• suspended hydraulic pile cropper</li> <li>• the above alternatives to hand-operated breakers, especially machine-mounted breakers</li> <li>• design pile spacing and pile re-bar for mechanised cropping</li> </ul> <p>Note: some dressing using hand-operated tools may still be required.</p>	Pile cropping. A review of current practice (HSE Inspector information leaflet, Aug 02)  Information from Loughborough University

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		EAV	ELV		
<u>Scabbling</u> using:  needle scalars  hammer type scabblers  pole type scabblers	5 (lowest) 18 (highest)  40 (highest)  10 (lowest) 40 (highest)	2 h 10 m  2 m  30 m 2 m	8 h 40 m  8 m  2 h 8 m	Scabbling purely for architectural aesthetic effect is <b>not acceptable</b> . Specify finishes that do not require scabbling. (Some finishes can be designed into shuttering using special moulds or chemical retardants and water jetting.)  Surface preparation to ensure a good concrete bond. Use alternative methods where technically appropriate: <ul style="list-style-type: none"> <li>grit blasting (wet or dry)</li> <li>use of chemical retarders and pressure washing</li> <li>cast in proprietary joint formers e.g. mesh formwork</li> <li>UHP water blasting (refer to CoP for safety guidance)</li> </ul>	Example: grit blasting Example: paint-on retarder Example: special formwork Codes of Practice from the Waterjetting Association
<u>Wall chasing</u> using hand-held breakers	8 (lowest) 15 (typical) 25 (highest)	45 m 15 m 5 m	3 h 1 h 20 m	<ul style="list-style-type: none"> <li>in new buildings, specify built-in ducting</li> <li>in existing buildings, consider overcoating existing plaster and building in the ducts</li> </ul>	Construction Industry Council guidance
<u>Drilling</u> masonry/concrete using:  electric hammer drills or “combihammers”	6 (lowest) 9 (typical) 25 (highest)	1½ h 40 m 5 m	5½ h 2½ h 20 m	Design and plan to avoid unnecessary drilling. Use, where appropriate: <ul style="list-style-type: none"> <li>jig-mounted drilling</li> <li>diamond core drilling (clamped in rig)</li> <li>cast-in anchors and channels for wall fixings instead of drill-and-fix types</li> <li>use of direct fastening tools</li> </ul>	

Note 1: The vibration magnitudes, and associated trigger times to exceed EAV/ELV, are indicative only and will vary depending on equipment type and conditions of use.

Note 2: changes of process to eliminate or reduce vibration may introduce other hazards to health (e.g. noise, dust) or safety which must be addressed and managed (e.g. hazards associated with lifting operations in some mechanised methods for pile cap removal).

**PLEASE FAX COMPLETED FORM TO: 020 7717 6681**  
**Alternative Processes for Construction – Feedback Form**

Your views are important to us so that we can improve the way we communicate information on managing the risks from hand arm vibration. We would be grateful if you could spare a couple of minutes to fill in this form and fax it back to us at the above number. Any information you provide will be treated in confidence and will only be used for research purposes. You do not have to give your contact details.

Please rate the following statements by ticking the box which most closely represents your level of agreement or disagreement with each statement.

	<b>Strongly Agree</b>	<b>Agree</b>	<b>Don't Know</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
The activities/processes listed include those that I was concerned with					
The information given was useful in helping my organisation decide whether it should be taking action					
I was able to understand the information on alternative working methods					
I found the alternative working methods were relevant/realistic					
The information in the linked references and related guidance was helpful					
My organisation intends to take action to apply the alternative working methods					

If you have any comments you would like to make, please do so in the space below:

**About you:**

Please tick the primary business of your organisation

Foundries	Construction	Manufacturing
Quarry/masonry		
Agriculture/forestry	Engineering supplier	Other <i>Please specify</i>

What is your role/job in your organisation?

Employee	Middle Manager	Senior Manager
Supervisor/Foreman	Health & Safety Professional	Union representative
Self employed	Other <i>Please specify</i>	

How many people work in your organisation?

Less than 50 employees	Between 51 and 250	Between 251 and 500
Between 501 and 1000	More than 1000	

**Thank you very much for your feedback. Please fax this to the number given at the top of the page**

HSE are always looking for new ideas and solutions to hand-arm vibration problems. If you are willing to share your experience with others please give your details below so that we can discuss this with you.

**Name:** ..... **Company:** .....

**Telephone number:**..... **Email:** .....