

Health and Safety
Executive



HSE – Noise & Vibration In Construction Scottish Construction Forum

February 2020

Chris Steel – Noise & Vibration Inspector

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1

Home - Money - Property - Buy

The Barbican turns 50: inside the hidden world of the brutalist heritage site

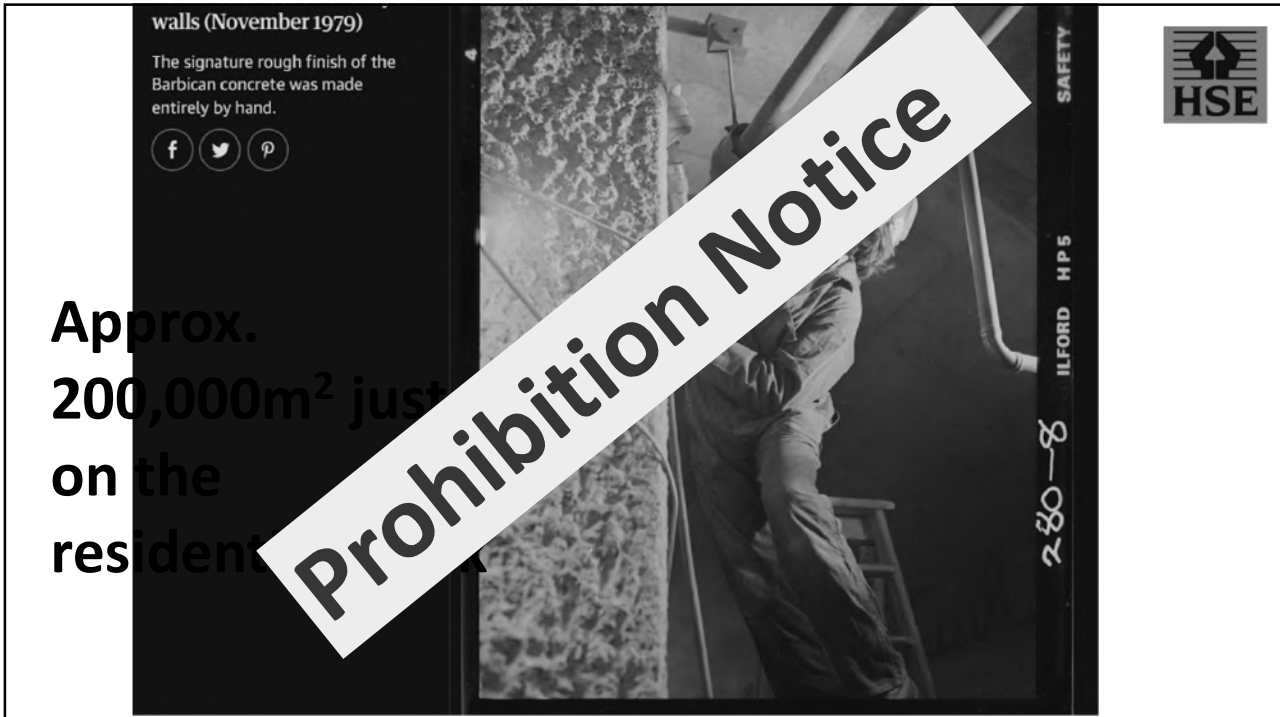


Back to the future: The Barbican estate has a recognisable brutalist style. CREDIT: ANDREW HOLT/CONSTRUCTION PHOTOGRAPHY/HULTON ARCHIVE

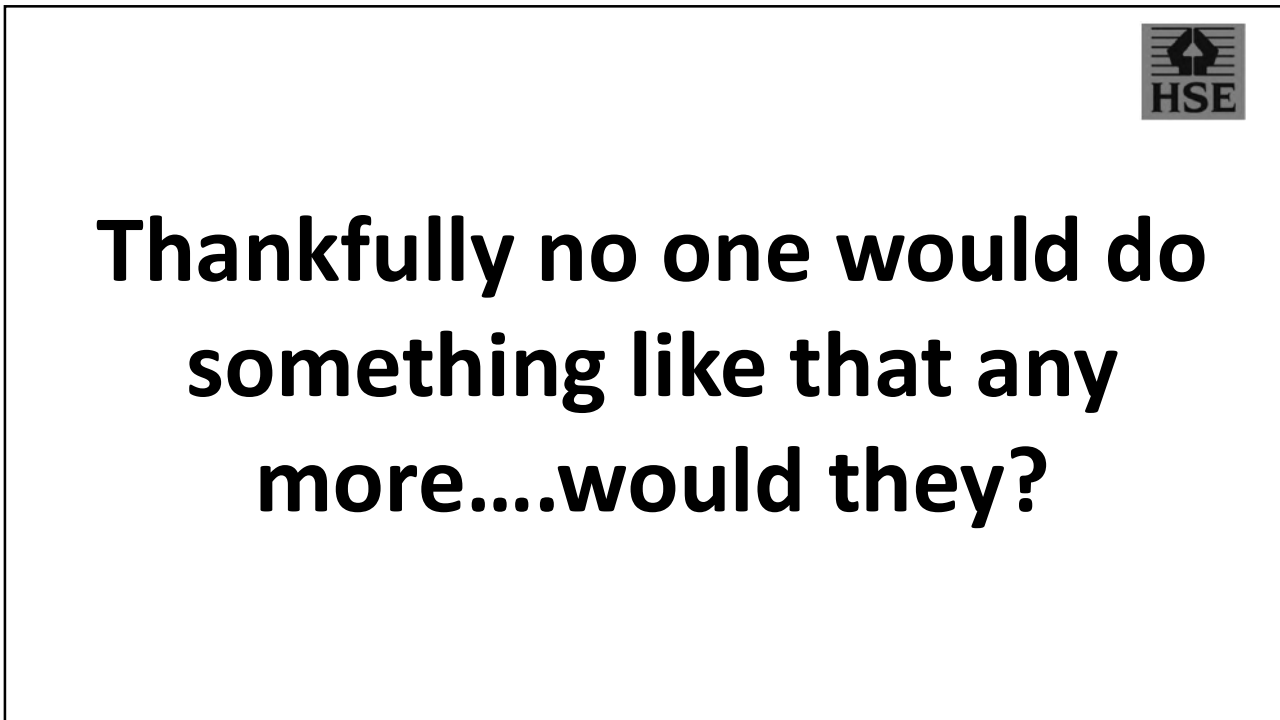
By Peter Watts

26 AUGUST 2018 - 12:00PM

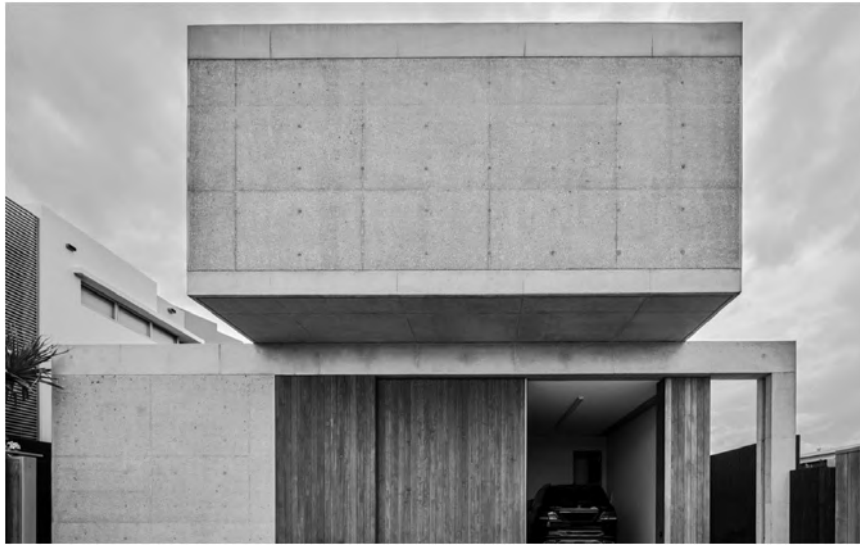
2



3



4



“..a technique called ‘scabbling’ which involves grinding back the skin of the concrete to expose the aggregate by hand with a specialist impact drill.”

AAN April 2019

5



**Poor design creates
avoidable noise &
vibration risks
(and dust, and safety)**

6



**Have you ever described
a workplace health issue
as a near miss?**

7



**An actual concern raised
by an employee to the
HSE.....**

8



“I am working on a project where I have to fix brackets to a floor slab and there are thousands of holes to be drilled”.

9



“I have calculated 468 holes will take 39 mins drill time which will put my exposure at 398 points (limit value)”.

10



How are you going to deal with it?

Why did this happen?

11



Hierarchy of Control

- **Eliminate - don't do it**
- **Substitution – find a safer way to do it**
- **Engineering controls - Source safer tools or equipment/adaptations**
- **Administrative Controls – Job rotation, time limiting**
- **PPE**

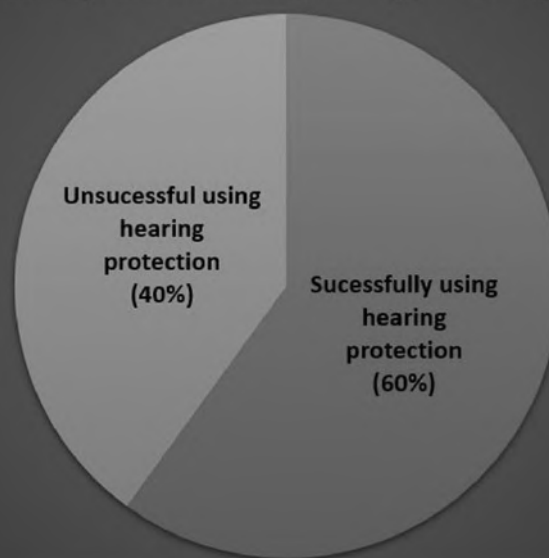
12



No PPE for Hand-arm vibration

13

Estimated Successful use of hearing protection in the UK as a % of the exposed workforce (HSL report RR720)



14



**You send everyone home
after they have spent 39
minutes drilling holes?**

15



That can be mounted in a drill rig

Which means you can use a non-
hammer action drill

Use small diameter diamond core

Use a diamond drill bit

Use a sharp drill bit

16

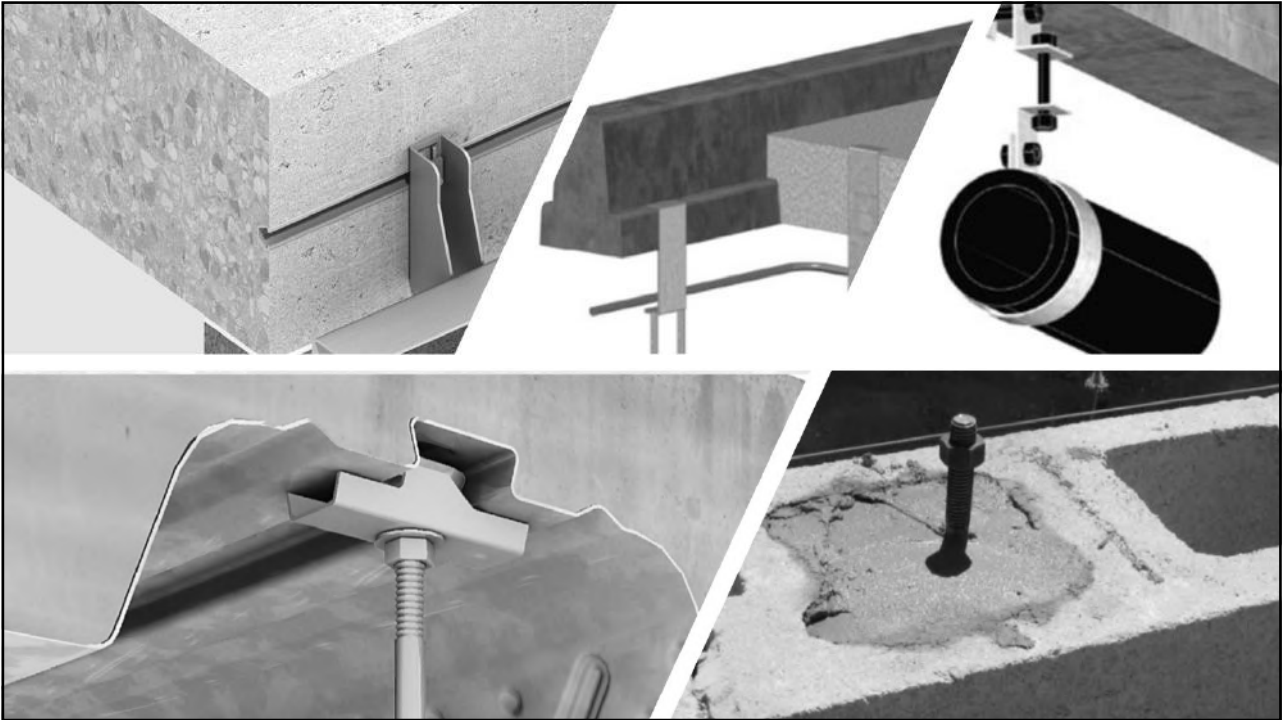


**Sometimes using tools
with a higher vibration
magnitude can be
suitable if the duration is
significantly shorter**

17



18



19



**Entirely a design issue so
why wouldn't raise this
with the designer?**

20



If we leave noise and vibration issue until we get to site we limit our options on control?

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So what does the HSE want you to do?

22



Understand the level of risk and exposure

Focus on the control

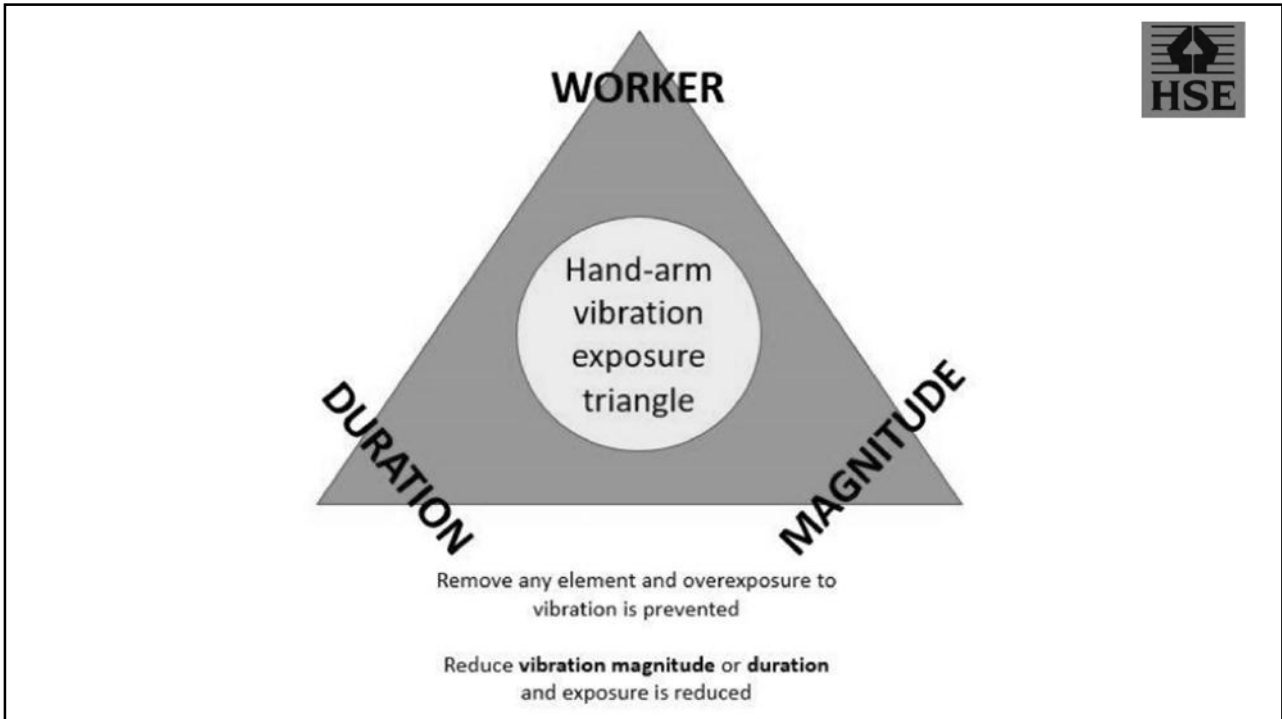
23



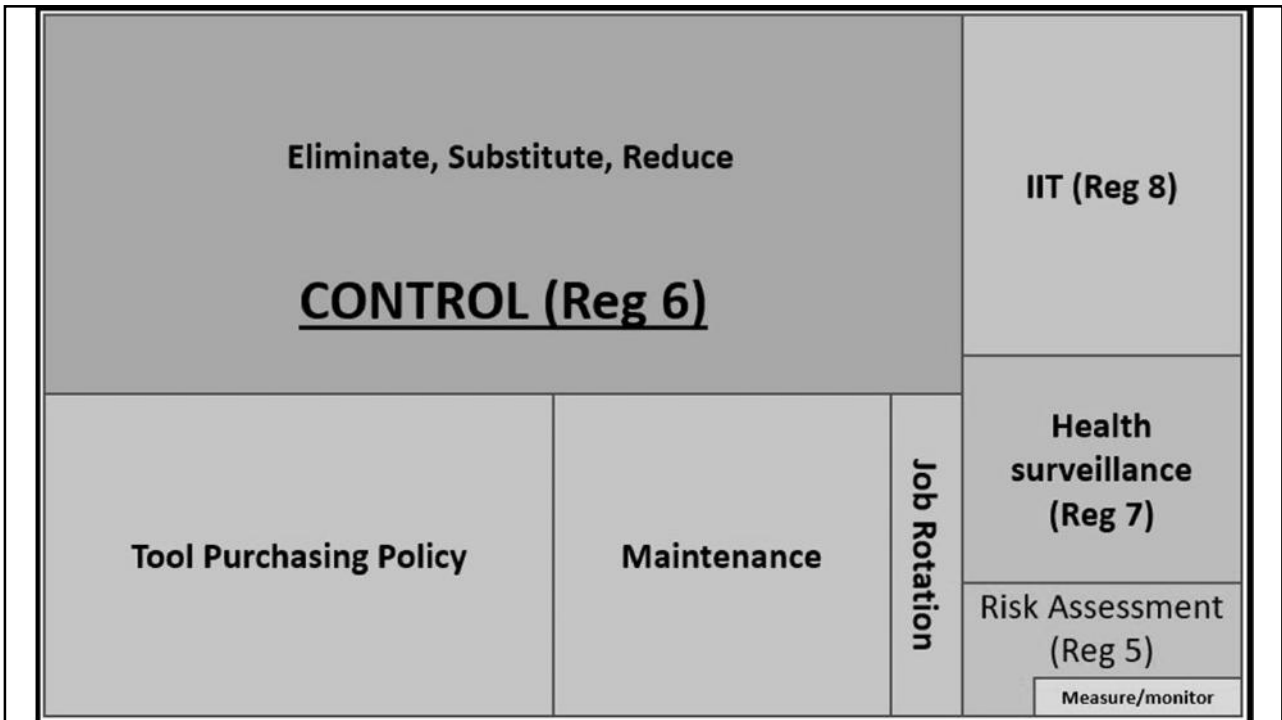
Remove any element and overexposure to noise is prevented

Reduce **loudness** or **duration** and exposure is reduced

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25



26

Risk assessments don't have to be massive

Vibration Task Assessment																																
ID Ref:																																
Date: 22/01/20																																
Vehicle/Plant ID:		Task Assessed:																														
Marc Egoptic		A-Frame Replacement																														
Does the task require the use of vibrating equipment? Yes																																
Work Location: Workshop		Employee(s) Exposed to HAV Risk:																														
	Equipment Used:	Magnitude (m/s ²)	Declared	Measured	Time on Task (rough time):																											
1	1/2 Air Gun	UT8355R	5.8	X	1 Min																											
2																																
3																																
4																																
Does time on task exceed Exposure Action Value *?																																
* HAV task assessment (MSD) to be assessed and daily exposure reduced to the EMV or below before the task is undertaken.																																
Details of work task / vibration task (tools using vibrating tools indicated in bold) This sequence only applies to one side of vehicle																																
<ol style="list-style-type: none"> 1 Take Lorry into workshop following normal procedures 2 Remove 4 side bolts with 27mm socket 3 Remove 2 center bolts with 36mm socket 4 Remove old A-frame and fit new one. 5 Refit 2 center bolts with 36mm socket 6 Refit 4 side bolts with 27mm socket 																																
Refer to main task risk assessment and site-specific risk assessment for health and safety information.																																
Details of Employees Exposure: -																																
The use of vibration tools would result in 3 points and 1.4 Magnitude m/s ² A8. Other work activities may be undertaken by the employee which need to be included in the daily exposure.																																
Additional Control Measures: -																																
PPE																																
Employee(s) were observed using equipment covering the above tasks. Using the worst-case scenario, the HAV exposure can be shown as:																																
HAND-ARM VIBRATION EXPOSURE CALCULATOR																																
<table border="1"> <thead> <tr> <th>Company name / work activity</th> <th>Activity/Task Name</th> <th>Exposure (m/s²)</th> <th>Time on task (h:m)</th> <th>Exposure (m/s²)</th> <th>Exposure (m/s²)</th> <th>Exposure (m/s²)</th> <th>Exposure (m/s²)</th> <th>Exposure (m/s²)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1/2 Air Gun</td> <td>5.8</td> <td>0:01</td> <td>0.0001</td> <td>0.0001</td> <td>0.0001</td> <td>0.0001</td> <td>0.0001</td> </tr> <tr> <td colspan="2">Total</td> <td></td> <td></td> <td>0.0001</td> <td>0.0001</td> <td>0.0001</td> <td>0.0001</td> <td>0.0001</td> </tr> </tbody> </table>						Company name / work activity	Activity/Task Name	Exposure (m/s ²)	Time on task (h:m)	Exposure (m/s ²)	Exposure (m/s ²)	Exposure (m/s ²)	Exposure (m/s ²)	Exposure (m/s ²)	1	1/2 Air Gun	5.8	0:01	0.0001	0.0001	0.0001	0.0001	0.0001	Total				0.0001	0.0001	0.0001	0.0001	0.0001
Company name / work activity	Activity/Task Name	Exposure (m/s ²)	Time on task (h:m)	Exposure (m/s ²)	Exposure (m/s ²)	Exposure (m/s ²)	Exposure (m/s ²)	Exposure (m/s ²)																								
1	1/2 Air Gun	5.8	0:01	0.0001	0.0001	0.0001	0.0001	0.0001																								
Total				0.0001	0.0001	0.0001	0.0001	0.0001																								

You know better than the HSE ever could how your work is programmed and the processes involved





Timber kit construction as an example



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How do I figure out vibration exposure from nail guns?

30



Company name / work area:		AWF construction									
Employee ID and/or task name:		First Fix Joiner									
Tool or process name <small>Select HSE recommended initial values or enter your own information</small>	Vibration magnitude m/s ²	Exposure points per hour	Time to reach EAV 2.5 m/s ² A (8)		Time to reach ELV 5 m/s ² A (8)		Exposure duration		Partial exposure m/s ² A (8)	Partial exposure points	
			hours	minutes	hours	minutes	hours	minutes			
Nail guns	9	162		37	2	28		45	2.8	122	

45 mins of nail gun use and we are above the action value NOT 45 nails

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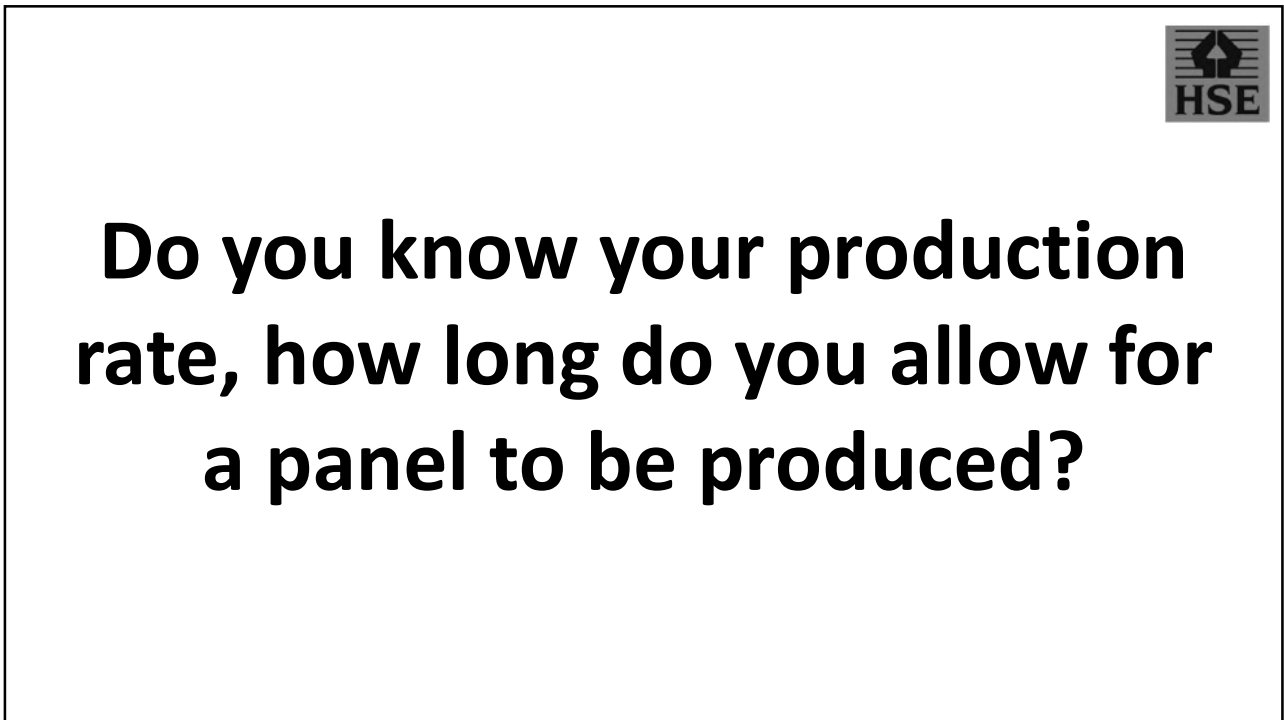


The time it takes for a nail gun to fire can be a fraction of a second (0.2-0.5 seconds).

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33



34




35



**Divide the total by number
of days then by number of
first fix joiners to get a
'typical' day**

36



Company name / work area: AWF construction
Employee ID and/or task name: 1st Fix Joinery Work - 3 Bed House type

Tool or process name <small>Select HSE recommended initial values or enter your own information</small>	Vibration magnitude <small>m/s²</small>	Exposure points per hour	Time to reach EAV <small>2.5 m/s² A (8)</small>		Time to reach ELV <small>5 m/s² A (8)</small>		Exposure duration		Partial exposure <small>m/s² A (8)</small>	Partial exposure points
			hours	minutes	hours	minutes	hours	minutes		
Nail guns	9	162		37	2	28		30	2.3	81
screw gun	3	18	5	33	22	13	1	5	1.1	20
Rip Saw	5	50	2		8			10	0.7	8

Lock Tool or process names
Zoom to fit
Help
Reset
Print (preview)


Instructions for use:
 Enter vibration magnitudes and exposure durations (for an individual worker or a task carried out by several workers) in the **white areas**. Results are displayed in the **yellow areas**
 Information on tool types may be entered directly into the tools/process names columns, or selected from a drop-down list of HSE recommended initial data values.
 To clear all cells, click on the 'Reset' button
 Tick the 'Lock tool or process name' check box to prevent 'Reset' clearing these cells
 Additional information such as company name, worker name may be added if printing or saving the calculation.

Daily exposure <small>m/s² A (8)</small>	Total exposure <small>points</small>
2.6	109

WARNING: Exposure at or above 2.5m/s²A(8) EAV (100 points)

Exposure calculation by: Brian Bushby

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We know this job and task approach can work because we have seen housebuilder in Scotland use it.

38



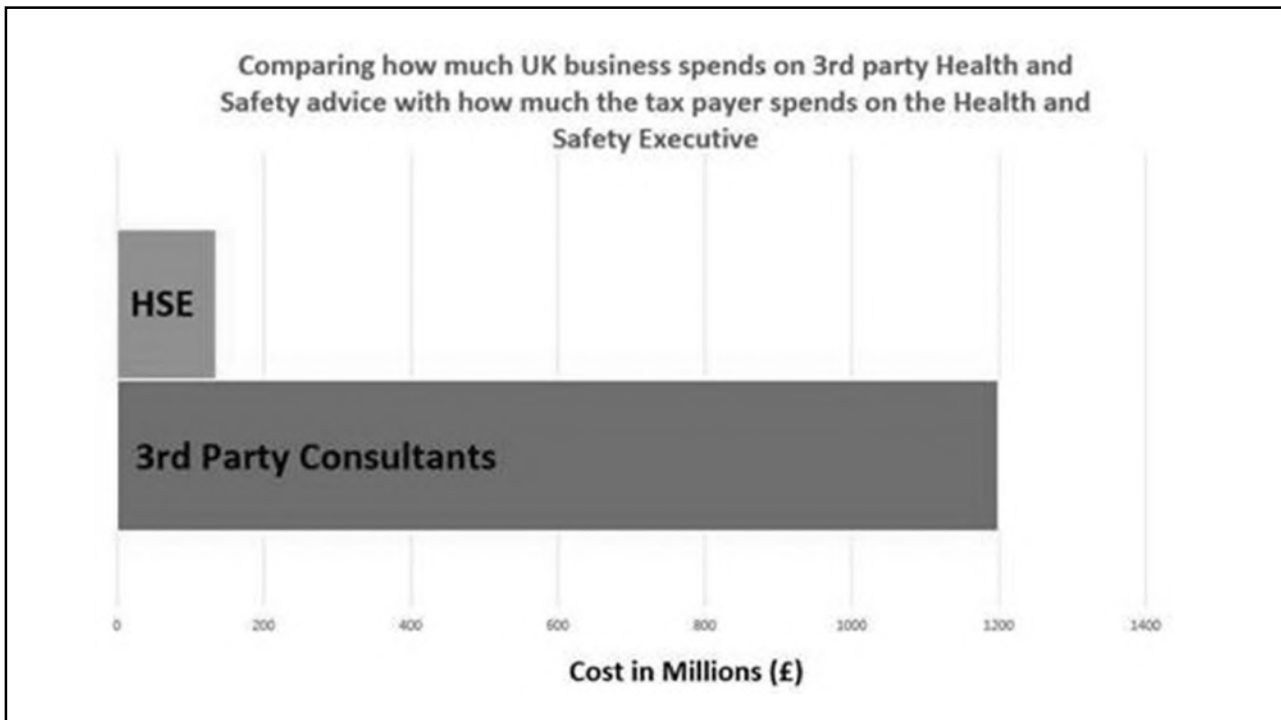
**What kind of advice
are you getting?**

39




**How do you think central
government funding for the
HSE compares to the amount
of money spent on all third
party Health and Safety
Consultancy advice?**

40



41



**If you are paying for
advice ask some
questions**

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Noise Consultancy industry 1 page buyers guide about to be published

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	Yes	No
You should make sure the consultant is competent to do the work		
<input type="radio"/> Are they qualified to measure and assess workplace noise (e.g. completed IOA, BOHS or IOSH certificate/module in workplace noise assessment)?		
<input type="radio"/> Are they a member of a professional body (ANC , BOHS , IOA or IOSH)?		
<input type="radio"/> If advice on control is to be provided can they show that they, or the project supervisor, have a suitable level of experience.		
<input type="radio"/> If they have not completed a workplace noise assessment course can they otherwise show that they have suitable experience?		
<input checked="" type="radio"/> Can they give examples of previous reports or examples of good work?		
To help you complete the risk assessment you need specific details regarding your employees' noise exposure. Check the report will include:		
<input type="radio"/> What your employee's exposure levels are in relation to the action and limit values stated in the noise at work regulations.		
<input type="radio"/> Advice on if you need to provide health surveillance.		
<input type="radio"/> The required performance of any hearing protection you may need give to your employees and/or an assessment of existing hearing protection used.		
<input checked="" type="radio"/> An executive summary for ease of understanding		
<input checked="" type="radio"/> A list of practical measures that you can implement to both reduce risk posed to your employees by exposure to noise and improve compliance		
You should provide suitable information to help the consultant do their job		
<input type="radio"/> Tell them if you need a noise survey or advice on control or both		
<input type="radio"/> Give them information about the work that you do, staff numbers and rolls, equipment operating and any areas where access may be difficult		
<input type="radio"/> Issue your site safety requirements for visiting contractors (e.g. time required for induction, PPE requirements)		
<input checked="" type="radio"/> Issue details of your existing hearing protection, " buy quiet scheme " and health surveillance		
<input checked="" type="radio"/> Provide a floorplan showing the location of equipment and noisy processes		
<input checked="" type="radio"/> Issue copies of any previous noise surveys you have had completed		

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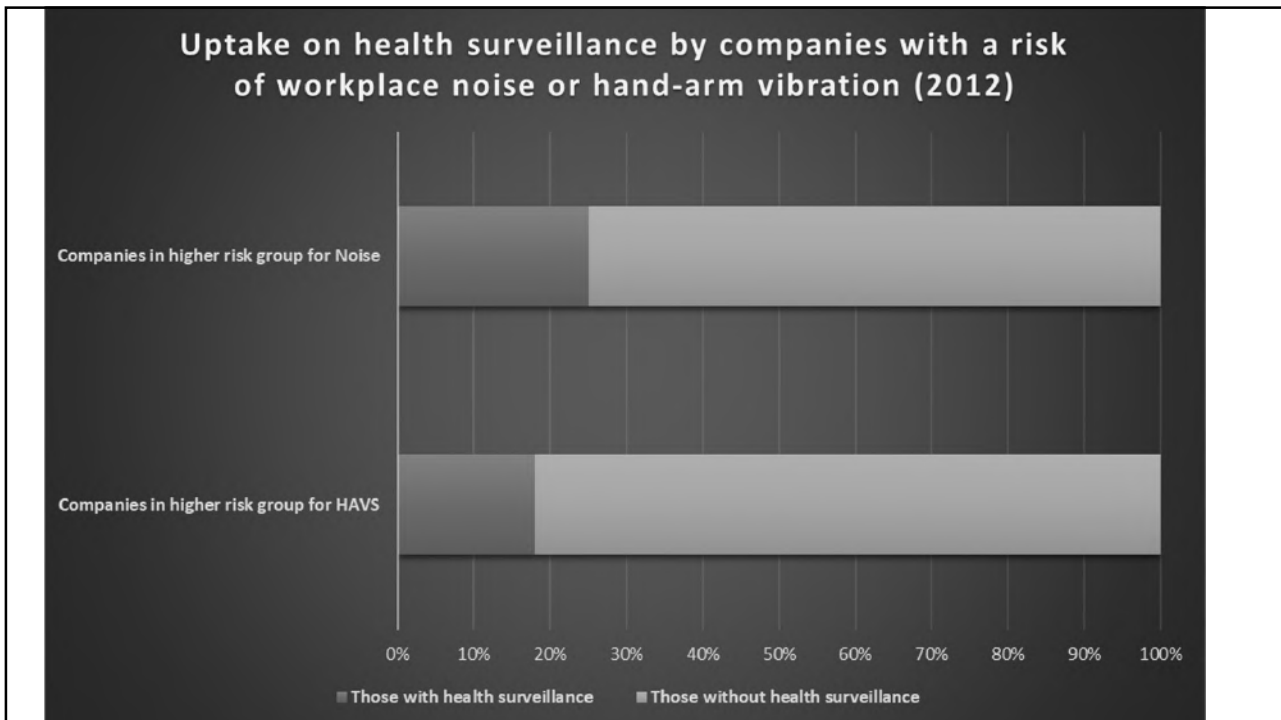
What is your health surveillance like?

45




What do you think the % uptake is on health surveillance for HAVS and Noise in high noise and HAV risk workplaces (last time we checked)?

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The purpose of health surveillance is to check your controls are working and protect you from civil litigation

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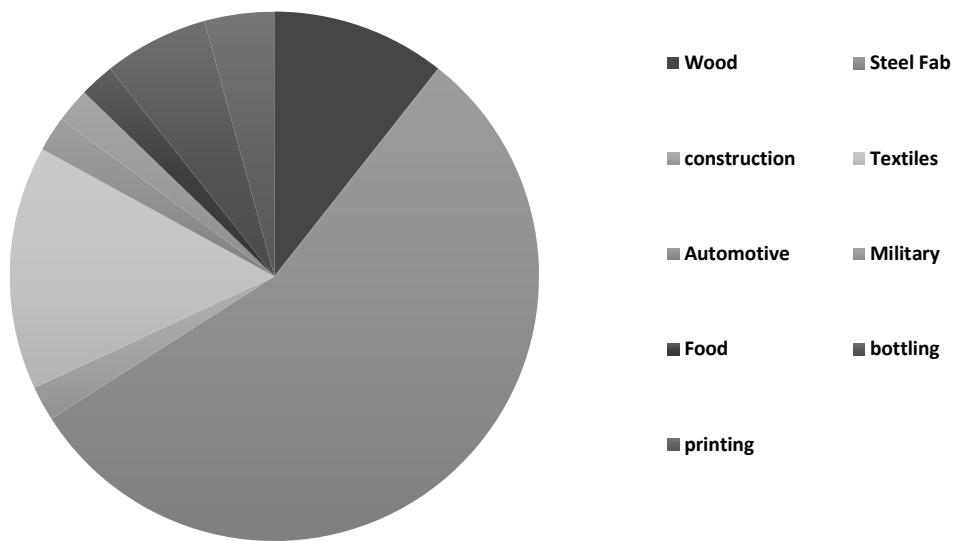


Does the Construction industry see a lot of Noise Induced Hearing Loss claims?

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NIHL Claims by Industry per 10,000 employees
(based civil claims snapshot 2019 expert witness cases)



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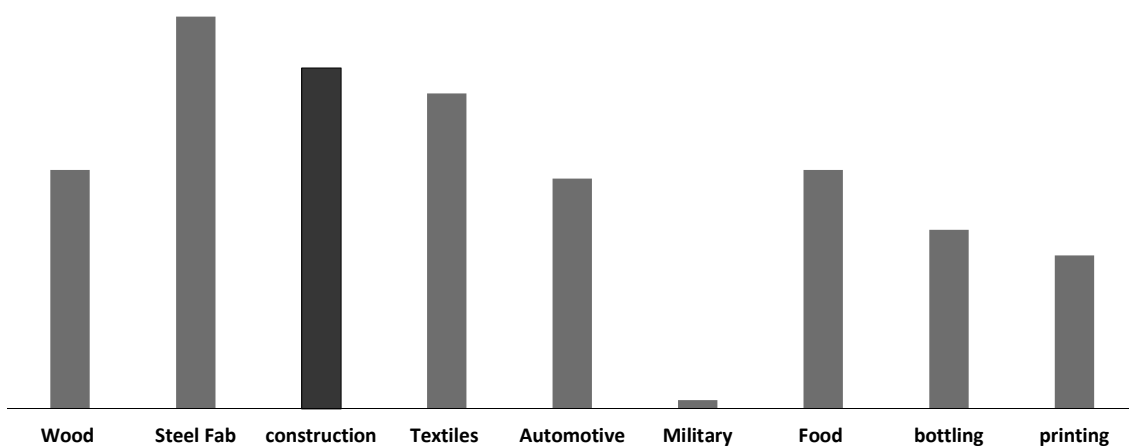


**That looks ok..doesn't it
(when we adjust it for
industry size)?**

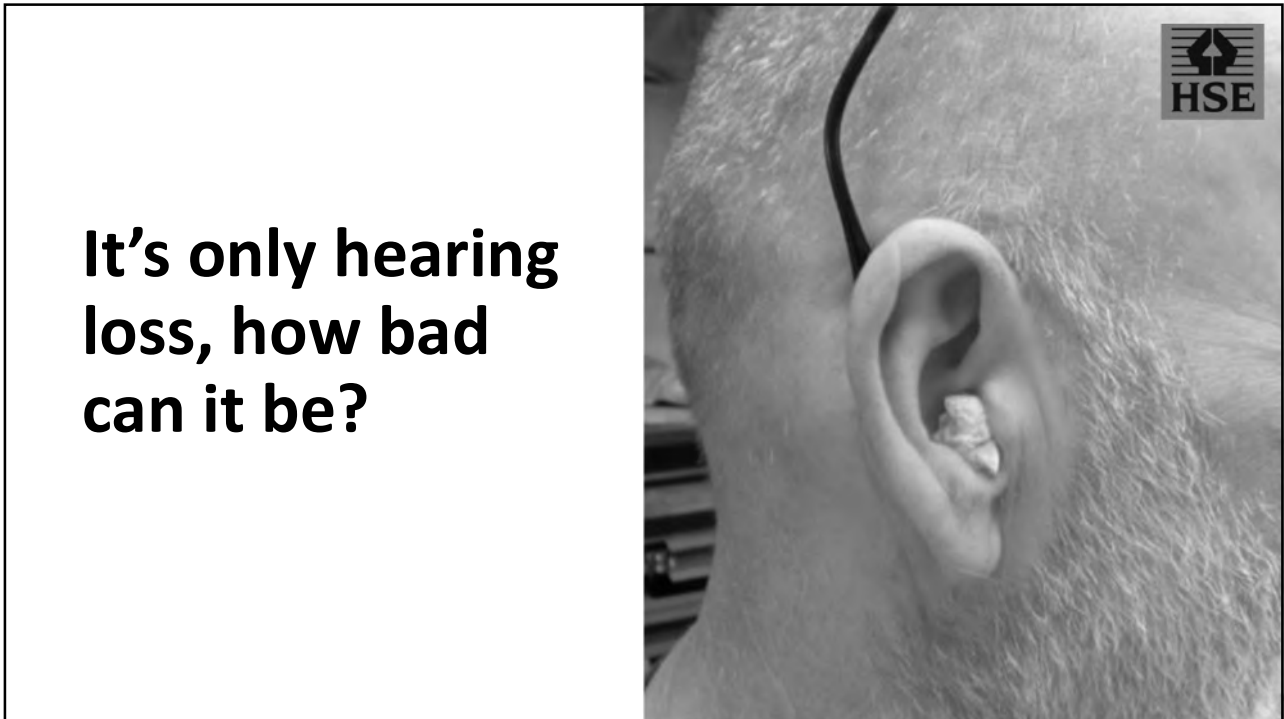
51



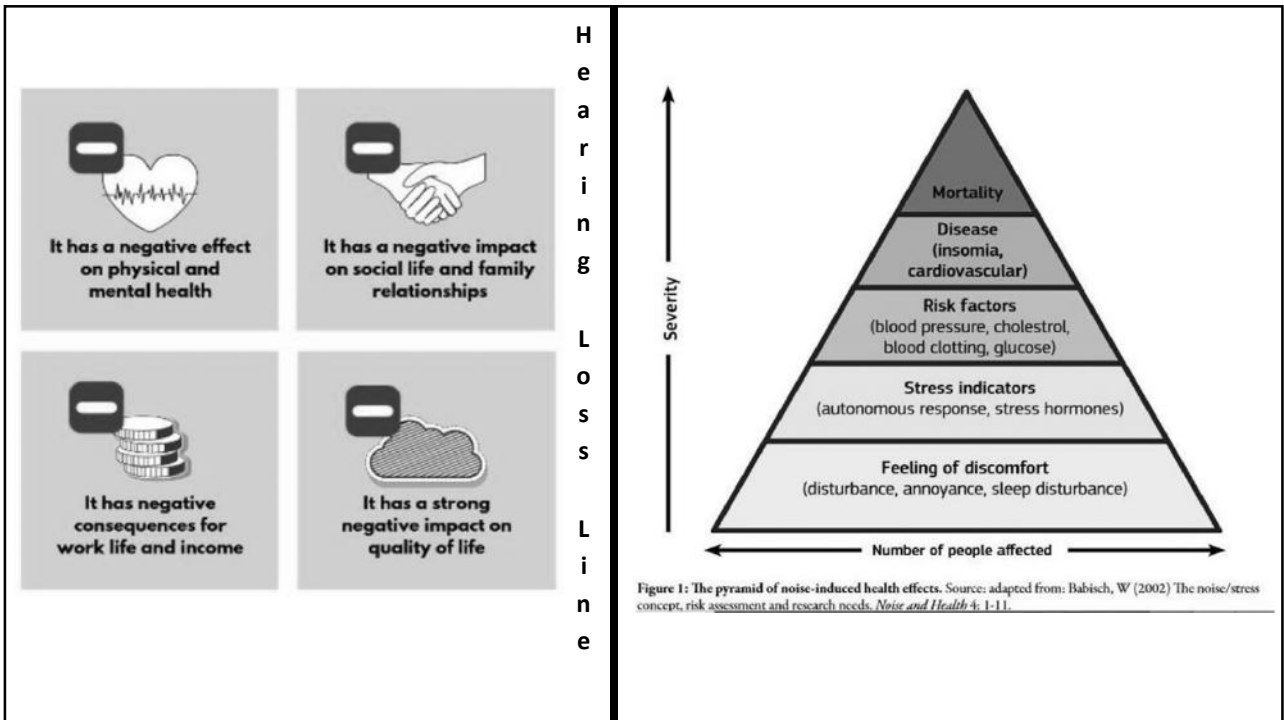
**Civil claims for NIHL based on actual number of claims (not adjusted
for industry size)**



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**CRU – Compensation Recovery
Unit, part of DWP
They collect Employer Insurance
Liability Claim statistics**



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**Employers' Liability
(Compulsory Insurance) Act 1969**

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**Does occupational
hearing loss make it into
the Employers Liability
Claims Health Top 10?**



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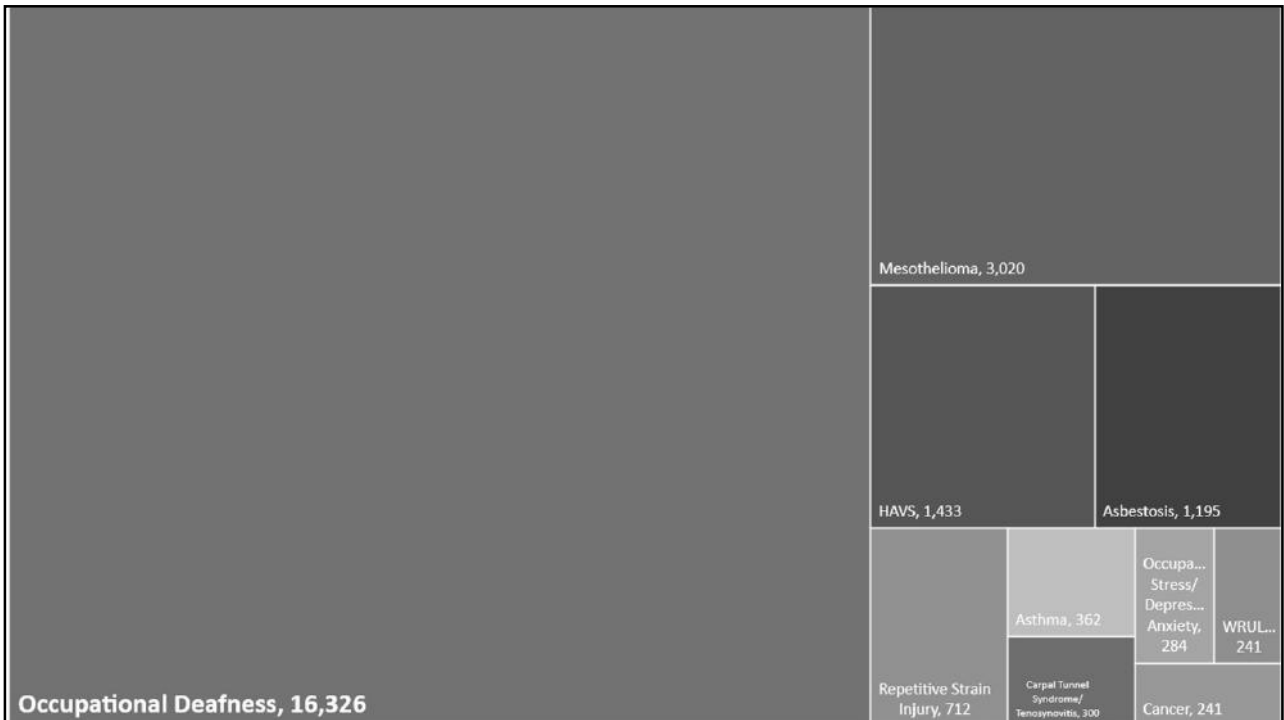


These are the diseases where claims are being made.



2015-2016 - Top 10 Occupational Diseases by Employer Liability Insurance Claim (CRU at DWP)

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**It's only
HAVS, how
bad can it
be?**



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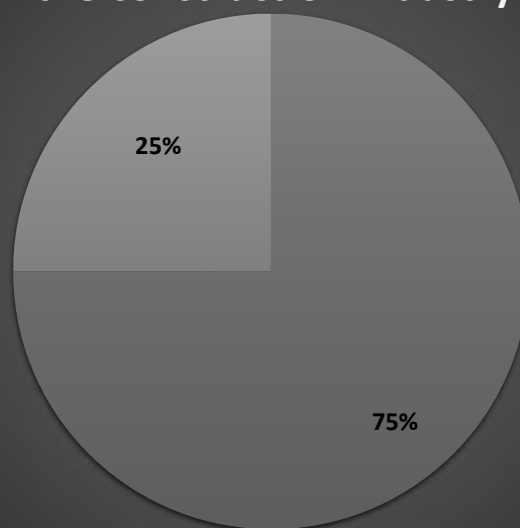
54 year old highly specialised mechanical engineer – made to retire

43 year old welder – made redundant and told that he can no longer work as a welder

24 year old construction worker – Told to re-train 3 years after completing apprenticeship

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Health related RIDDOR's sent to HSE from the construction industry



■ HAVS ■ all other Health RIDDORS

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**What do we have that is (relatively)
new to help you with control?**

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**We have updated the guidance
document on hand-arm vibration
(L140)**

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Where do we get a copy?



http://www.hse.gov.uk/pubns/books/l140.htm

Hand-arm vibration - L140

HSE Health and Safety Executive

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Resources

- Publications
 - Endorsing third party guidance
 - + Free leaflets
 - + COSHH Essentials
 - Newsletters
 - MDHS

Hand-arm vibration

The Control of Vibration at Work Regulations 2005

 **Date of publication:** July 2019
ISBN: 9780717665655
Series code: L140
[Download a free copy](#)
[Buy this product](#)

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What are the main things I should know about the update to the guidance on the control of hand-arm vibration (L140)?

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Changes to L140



- **Shorter – case studies removed**
- Rule of thumb more obvious
- Includes vibration data table
- Warm clothes for those exposed who work outside a must
- Sections rearranged – to help flow of document
- Legislation remains unchanged – advice puts more focus on control

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Table 3 Examples of alternative work processes to eliminate or reduce exposure to vibration

Industry	Problem	Solution
Amenity horticulture	Use of power tools (eg hedge trimmers, chainsaws, trimmers and mowers) for park maintenance	Consider allowing more natural meadow, hedge and tree growth Select slow-growing/low-growing shrubs Use vehicle-mounted machinery such as a side-arm flail
Construction	Use of scabbling tools and needle scalars for architectural finishes	Specify architectural finishes and processes that don't require the use of powered hand tools (eg chemical retardants, shuttering)
	Cutting and patching of stone, wood or concrete products to fit using powered hand tools on site	Prefabricate components using factory-based machining
	Use of demolition hammers to break up large concrete blocks and walls	Split large blocks using hydraulic expanding devices inserted into pre-drilled holes (bursting) or use driven or remote control plant which can be fitted with nibblers and peckers
	De-scaling of steel structures after fabrication using pneumatic scaling tools	Use abrasive blasting or high-pressure water jetting instead of pneumatic scaling tools

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Table 2 Durations after which it is likely that the action value or limit value will have been reached

Power tool or machine type	Time to EAV	Time to ELV
Rotary	1 hour	4 hours
Percussive	15 mins	1 hour

Note 1: Employers should hold information to justify usage beyond the times indicated in this table; for example, machines that incorporate effective vibration-reducing design features may have lower vibration magnitudes, allowing longer use before the action values are reached.

Note 2: The exposure durations shown are those after which it is likely that the EAV or ELV will have been reached with **modern well-designed and maintained machines**. Older, poorly designed or poorly maintained machines may reach the EAV and ELV much sooner.

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HAND-ARM VIBRATION EXPOSURE CALCULATOR

Version 5.6 June 2019

Company name / work area:

Employee ID and/or task name:

Tool or process name <small>Select HSE recommended initial values or enter your own information</small>	Vibration magnitude m/s ²	Exposure points per hour	Time to reach EAV 2.5 m/s ² A (8)		Time to reach ELV 5 m/s ² A (8)		Exposure duration		Partial exposure m/s ² A (8)	Partial exposure points
			hours	minutes	hours	minutes	hours	minutes		
Plate compactors - non-AV	18	648		9		37				
Chainsaws										
Mowers - Hand-guided										
Mowers - Ride on										
Hedge trimmer										
Drills - Core - 76 - 100mm										
Drills - Hole saw										
Drills - Impact - 13mm masonry bit										
Drills - Impact - 5 & 8 mm masonry bit										

Zoom to fit **Help**

Reset **Print (preview)**

Reset Options:

Instructions for use:
Enter vibration magnitudes and exposure durations (for an individual worker or a task carried out by several workers) in the white areas. Results are displayed in the yellow areas.
Information on tool types may be entered directly into the tools/process names columns, or selected from a drop-down list of HSE recommended initial data values.
To clear all cells, click on the 'Reset' button.
Tick the 'lock tool or process information' check box to prevent 'Reset' clearing these cells.

Daily exposure
m/s² A (8)

Total exposure
points

70



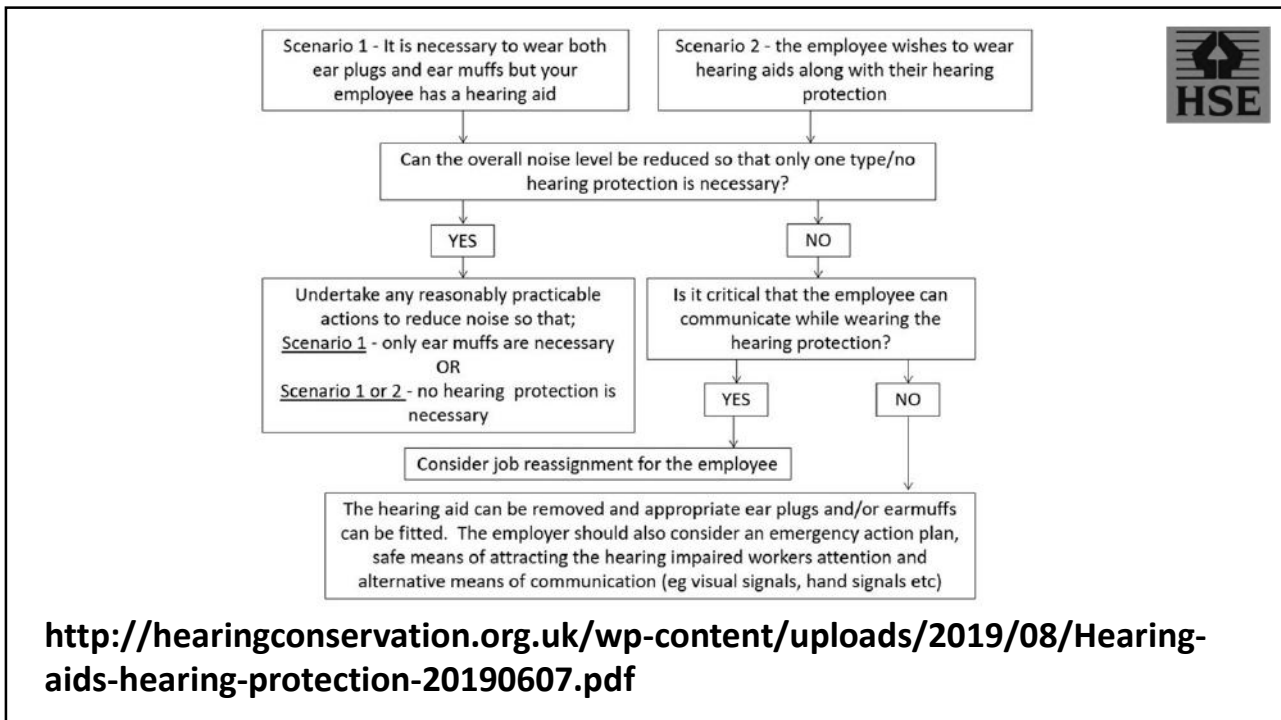
**There is new industry held
information on noise at work issues**

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**If you get questions about
hearing protection and
hearing aids there is now
industry guidance held by
the UK Hearing Conservation
Association**



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If you get questions about what buy quiet is and want a simple two page outline on what to do

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Edition 2018



"BUY QUIET"

Advice for buyers of machinery

➤ This leaflet helps you buy or hire lower noise machinery and meet your legal duties.

➤ Noise has hidden costs and harms workers.

➤ It is likely that you have a choice between noisier and quieter models of machinery. The only way to know is to have a "Buy Quiet" policy.

➤ Why buy a noise problem when you could buy quieter machinery?

➤ If you and your industry ask for quiet machinery – "Buy Quiet" – suppliers will see a commercial advantage to making lower noise machinery. And if your suppliers market quiet machinery – "Sell Quiet" – the cost and effort to manage noise risk in your company will reduce.

➤ **ALWAYS** consider noise before buying or hiring new machinery.

Why should I Buy Quiet?

Noise is bad for health. It causes hearing damage and dizziness, stress, poor productivity, and interferes with communication. Injury to hear causes workplace accidents and deaths.

Your company is legally responsible for managing risks from noise for its employees – the quieter the machinery you buy for your company, the easier this will be.

Buying Quiet:


- Reduces the costs of managing noise risks:
- Increases productivity and reduces the number of sick days.
- Reduces the need to buy and manage health surveillance, noise control, hearing protection.
- Reduces compensation costs and insurance premiums (depending on country).

What noise information should I obtain before buying or hiring machinery?

Where manufacturers have been unable to eliminate noise risk, they must:

- Provide noise emission data in their sales literature and instruction manuals:
 - Noise emission values provided should be for the noisiest typical operation.
 - Manufacturers may be able to provide noise emission data for other common applications.
- Tell you how to use their equipment without risk from noise:
 - What noise control options are available and appropriate for your operation.
 - How to install and assemble the machinery so that noise risk is minimised.
 - What special training in noise control is required for users.
 - The need for hearing protection.

<https://www.av.se/globalassets/filer/halsa-och-sakerhet/nomad-buy-quiet-guide-edition-2018.pdf>



I will leave you with two thoughts



Eliminate by 2030 as an occupational disease, new cases of noise induced hearing damage....

<http://www.hse.gov.uk/noise/workingwithus.htm>

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Control by 2015 as an occupational disease new cases of HAVS sufficiently to enable workers to remain at work without disability...

d

<http://www.hse.gov.uk/noise/workingwithus.htm>

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Good luck

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February 2020

Chris Steel – Noise & Vibration Inspector

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