

Dust control

For the demolition of existing bungalow and
construction of a new five-bedroom dwelling with garage at
2 Somerset Lane Cefn Coed CF48 2PA

Introduction

This project involves the demolition of an entire three-bedroom bungalow located on Somerset Lane, followed by the construction of a new five-bedroom dwelling with a garage.

It is anticipated that due to the proximity to other dwellings both above and below the property some of the demolition will be carried out by hand. Initially work will commence with the removal of internal wall whilst the windows remain in place. Extraction of dust will be used during this process to control the dust levels during this process. Following this the roof will be removed by hand, thus four remaining external walls will remain. The remaining external walls will then be removed by forcing them into the centre of the property containing the rubble to one area. Dust suppression will be best achieved by constant water being sprayed onto the area during removal. As well as relying on poor damp weather conditions.

The new dwelling will be constructed of blockwork and external cladding., generally it is anticipated that the use of hand tools will be the main appliance used. Prior to the commencement of the demolition an analysis of work should be carried out of the likelihood of creating dust from certain activities undertaken.

Measure to be considered and implemented

There are operations that are likely to create dust, these will be considered prior to commencement and the following should be implemented:

- A mains water supply will be available on site from the commencement of any works.
- The choice of plant and equipment will be considered. The method of any work should reflect the necessity to control dust levels. Generally, where alternative methods exist these will be used.
- Where adequate dust cannot be achieved by the equipment or method the most common means of dust control will be used including the use of water and/or containment through screens or enclosures.
- Dust suppression delivered by an onsite water bower or equivalent. Management should ensure that an effective and reliable water source is available on site at all working hours.

- These measures have a good effect for operations such as cutting or sandblasting stone or concrete as well as more general application where dampening can prevent excessive spread or dust from stockpiles.
- Materials such as sand and cement products should be store where practical such as under cover and within sealed containers.
- There is practical limitation with both water suppression and screening. In warm weather water may evaporate quickly leaving the site in a condition likely to result in dust emission through wind whipping or vehicle movement.
- Secondary sources of dust emission must also be considered for the importance of cleaning secondary sources may be a result of vehicles and the highways becoming coated with dust.
- Liaison with neighbours is also advised where for whatever reason the creation of dust cannot be limited. Liaison will ensure that neighbours are advised to close windows and doors and delay hanging clothes outdoors.

Guidance has also been attached from HSE document – construction dust.



Health and Safety
Executive

Construction dust

HSE information sheet

Construction dust is not just a nuisance; it can seriously damage your health and some types can eventually even kill. Regularly breathing these dusts over a long time can therefore cause life-changing lung diseases.

This sheet tells employers what they need to know to prevent or adequately control construction dust risks. It also provides advice for safety representatives and workers.

Construction dust

This is a general term used to describe different dusts that you may find on a construction site. There are three main types:

- silica dust – created when working on silica-containing materials like concrete, mortar and sandstone (also known as respirable crystalline silica or RCS);
- wood dust – created when working on softwood, hardwood and wood-based products like MDF and plywood;
- other 'general' dust – created when working on other materials containing very little or no silica. The most common include gypsum (eg in plasterboard), limestone, marble and dolomite.

Health risks

Anyone who breathes in these dusts should know the damage they can do to the lungs and airways. The main dust-related diseases affecting construction workers are:

- lung cancer;
- silicosis;
- chronic obstructive pulmonary disease (COPD);
- asthma.

Some lung disease, like advanced silicosis or asthma,

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Figure 1 Common tasks like cutting can create very high dust levels

However, most of these diseases take a long time to develop. Dust can build up in the lungs and harm them gradually over time. The effects are often not immediately obvious. Unfortunately, by the time it is noticed the total damage done may already be serious and life changing. It may mean permanent disability and early death.

Construction workers have a high risk of developing these diseases because many common construction tasks can create high dust levels. Over 500 construction workers are believed to die from exposure to silica dust every year. The amounts needed to cause this damage are not large. The largest amount of silica someone should be breathing in a day **after using the right controls** is shown below next to the penny.



silica dust



The law

The Control of Substances Hazardous to Health Regulations 2002 (COSHH) cover activities which may expose workers to construction dust.

There are three key things you need to do:

- Assess (the risks)
- Control (the risks)
- Review (the controls)

Assess (the risks)

Assess the risks linked to the work and materials. Examples of high-risk tasks are listed in Table 1. High dust levels are caused by one or more of the following:

- task – the more energy the work involves, the bigger the risk. High-energy tools like cut-off saws, grinders and grit blasters produce a lot of dust in a very short time;
- work area – the more enclosed a space, the more the dust will build up. However, do not assume that dust levels will be low when working outside with high-energy tools;
- time – the longer the work takes the more dust there will be;
- frequency – regularly doing the same work day after day increases the risks.

Control (the risks)

Use the following measures to control the risk. Examples of controls for common high-risk tasks are given in Table 1.

Stop or reduce the dust

Before work starts, look at ways of stopping or reducing the amount of dust you might make. Use different materials, less powerful tools or other work methods. For example you could use:

- the right size of building materials so less cutting or preparation is needed;
- silica-free abrasives to reduce the risks when blasting;
- a less powerful tool – eg a block splitter instead of a cut-off saw;
- a different method of work altogether – eg a direct fastening system.

Control the dust

Even if you stop some dust this way, you may do other work that could still produce high dust levels. In these cases the most important action is to stop the dust getting into the air. There are two main ways of doing this:

- **Water** – water damps down dust clouds. However, it needs to be used correctly. This means enough water supplied at the right levels for the whole time that the work is being done. Just wetting the material beforehand does not work.



Figure 3 Water suppression on a cut-off saw

- **On-tool extraction** – removes dust as it is being produced. It is a type of local exhaust ventilation (LEV) system that fits directly onto the tool. This 'system' consists of several individual parts – the tool, capturing hood, extraction unit and tubing. Use an extraction unit to the correct specification (ie H (High) M (Medium) or L (Low) Class filter unit). Don't just use a general commercial vacuum.



Figure 4 Wall chasing using on-tool extraction

Respiratory protective equipment (RPE)

Water or on-tool extraction may not always be appropriate or they might not reduce exposure enough. Often respiratory protection (RPE) has to be provided as well. You will need to make sure that the RPE is:

- adequate for the amount and type of dust – RPE has an assigned protection factor (APF) which shows how much protection it gives the wearer. The general level for construction dust is an APF of 20. This means the wearer only breathes one twentieth of the amount of dust in the air;
- suitable for the work – disposable masks or half masks can become uncomfortable to wear for long periods. Powered RPE helps minimise this. Consider it when people are working for more than an hour without a break;
- compatible with other items of protective equipment;
- fits the user. Face fit testing is needed for tight-fitting masks;
- worn correctly. Anyone using tight-fitting masks also needs to be clean shaven.

Remember: RPE is the last line of protection. If you are just relying on RPE you need to be able to justify your reasons for this.

Other controls

Depending upon the work you are doing you may have to combine these measures with other controls. Think about:

- limiting the number of people near the work;
- rotating those doing the task;
- enclosing the work to stop dust escaping. Use sheeting or temporary screens;
- general mechanical ventilation to remove dusty air from the work area (eg in enclosed spaces such as indoors);
- selecting work clothes that do not keep hold of the dust.

You also need to make sure workers are doing the job in the right way and are using controls properly. Train workers:

- about dust risks and how this can harm their health;
- how to use the dust controls and check that they are working;
- how to maintain and clean equipment;
- how to use and look after RPE and other personal protective equipment (PPE);
- what to do if something goes wrong.

Review (the controls)

You may already have the right controls in place, but are they all working properly? Check the controls work by:

- having procedures to ensure that work is done in the right way;
- checking controls are effective. Does the work still seem dusty? You might need to carry out dust exposure monitoring;
- involving workers. They can help identify problems and find solutions;
- maintaining equipment:
 - follow instructions in maintenance manuals;
 - regularly look for signs of damage. Make repairs;
 - replace disposable masks in line with manufacturer's recommendations;
 - properly clean, store, and maintain non-disposable RPE. Change RPE filters as recommended by the supplier;
 - carry out a thorough examination and test of any on-tool extraction system at least every 14 months.
- supervising workers. Make sure they:
 - use the controls provided;
 - follow the correct work method;
 - attend any health surveillance where it is needed.

You may have to put a health surveillance programme in place. You may need advice for this from an occupational health professional.

Table 1 Controls for common high-risk tasks

Task	Eliminate or limit the dust by:	Control the dust by using:
Cutting concrete kerbs, blocks and paving with a cut-off saw	- Limiting the number of cuts during design/layout - Using lower energy equipment like block splitters - Getting material cut off site and delivered	- Water suppression and - RPE* with an APF of 20
Chasing concrete and raking mortar	- Limiting the need for chasing at the design/layout stage - Using a work method that limits/does not need chasing, like over-covering cables	- On-tool extraction using an H or M Class extraction unit and - RPE* with an APF of 20 – consider powered RPE for longer duration work
Cutting roofing tiles with a cut-off saw	- Hand cutting natural/fibre cement slates and other tiles where possible - Using ½ and 1½ tiles - Correct setting out/design - Minimising valleys/using dry valleys	- Water suppression and - A dedicated cutting area with scaffold board protection and - RPE* with an APF of 20
Scabbling or grinding with hand-held tools	- Specifying architectural finishes that do not need scabbling - Using (ultra) high-pressure water jetting - Using chemical retarders and pressure washing - Casting in proprietary joint formers, eg mesh formwork	- Where possible use on-tool extraction using an H or M Class extraction unit and - RPE* with an APF of 20
Occasional short-duration drilling with hand-held rotary power tools	- Limiting the number of holes during design/planning - Using direct fastening or screws	- Where possible use equipment that stops dust getting into the air. The larger the holes the better this needs to be. Options range from: - drilling through a dust 'collector' or using cordless extraction attached to the drill (for smaller drill bits) or - on-tool extraction using an H or M Class extraction unit - Otherwise use RPE* with an APF of 20
Drilling holes with hand-held rotary power tools as a 'main activity'	- Limiting the number of holes during design/planning - Using direct fastening or screws	- Where possible on-tool extraction using an H or M Class extraction unit and - RPE* with an APF of 20
Dry coring	Limiting the number of holes during design/planning	- On-tool extraction using an H or M Class extraction unit - Longer duration work will also need RPE.* Use an APF of 20
Wet coring	Limiting the number of holes during design/planning	- Water suppression - Long periods of wet coring in enclosed spaces may also need RPE.* Use an APF of 20
Using a hand-held breaker in enclosed spaces with limited ventilation	- Limiting the amount of breaking during design/planning stage - Bursting, crushing, cutting, sawing or other techniques - Remote controlled demolition	- On-tool extraction using an H or M Class extraction unit and - RPE* with an APF of 20

Task	Eliminate or limit the dust by:	Control the dust by using:
Abrasive pressure blasting	■ Using a different method of work like (ultra) high-pressure water jetting ■ Using 'silica free' abrasive material	■ Wet or vacuum blasting and ■ RPE* will depend on silica content of building materials, blasting equipment and length of work: - In most instances use RPE with an APF of 40 - Use RPE with an APF of 20 for lower risk work (including the 'potman' nearby) ■ Shrouds or screens to contain the flying abrasive ■ Certain restricted/enclosed working places may also need general mechanical ventilation
Soft strip demolition	■ Carefully planning the work ■ Limiting the number of people that need to be in the work area ■ Screening off areas to prevent dust spreading	■ Use water suppression or on-tool extraction for those tasks where it is possible and ■ RPE* with an APF of 20 – consider powered RPE for longer duration work ■ Enclosed spaces may also need general mechanical ventilation to remove dusty air
Removing small rubble, dust and debris	■ Limiting waste materials during design/ planning ■ Considering where waste material is created and how frequently it needs removing ■ Using the correct dust controls when making rubble/debris	■ Damping down and using a brush, shovel and bucket for minor/small 'one-off' amounts - Or for regular removal/site cleaning: ■ Water spray for damping down ■ Rake, shovel and bucket/wheelbarrow to remove larger pieces ■ Covered chutes and skips where needed ■ Vacuum attachments fitted to an H or M Class extraction unit ■ RPE* with an APF of 20 depending upon location, duration and type of work
Cutting wood with power tools	■ Ordering pre-cut materials ■ Using dedicated cutting areas to minimise spread	■ On-tool extraction using an H or M Class extraction unit ■ RPE* with an APF of 20 in most situations
Sanding wood with power tools	■ Using 'pre-finished' materials	■ On-tool extraction using an H or M Class extraction unit and ■ RPE* with an APF of 20
Sanding plasterboard jointing	■ Using other finishes/systems ■ Select boards with tapered edges to limit finishing needed	■ On-tool extraction using an H, M, or L Class extraction unit

* Table 2 Common RPE types for construction dust

APF	Common RPE types for construction dust
20	■ FFP3 disposable mask or half mask with P3 filter - Or for longer duration work: ■ Powered RPE such as a TH2 powered hood/helmet
40	■ Abrasive blasting helmet with constant flow airline

Further information

Further information on dust and other construction health risks can be found at www.hse.gov.uk/construction/healthrisks/index.htm

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit www.hse.gov.uk/. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

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