

LIFE-LONG LEARNING:

What is it?

The health and safety document demonstrates how you control the health and safety of your quarry by identifying how the quarry operator plans, organises, controls, monitors and reviews the health and safety measures at the quarry.

Remember: The operator must ensure that no work is carried out at the quarry unless a health and safety document has been prepared to demonstrate that risks have been assessed and control measures identified, put in place, followed and reviewed.



Control vehicle risks

You should draw up a health and safety document which identifies the risks, identifies suitable control measures, enables you to put

the control measures in place, and review it to ensure that the control measures are practical and work properly in the workplace, or modify them as necessary.

Is there a set format?

No, the document may be in any form. However, it has to satisfy the following criteria:

- the quarry may not be worked without it;
- it has to be understood by anyone who reads it;
- the relevant parts have to be given to those with responsibilities in it;
- it has to be readily accessible to all quarry employees;

- it has to comprehensively identify risks and control measures used;
- it has to set out the structure, duties, competencies and authority of the management;
- it has to set out how and when the control measures will be reviewed.

The following format is recommended.

Part 1 introduces the quarry. Outline its purpose, ie why and how it is worked.

Summarise the main risks and conclusions, or the risk assessment and control measures, showing:

- how the design has minimised risks;
- what the management structure is;
- what the co-ordination measures are and who is responsible;
- the competencies of those involved in the design and safe working of the quarry.

Part 2 includes the detailed design considerations, risk assessment and control measures, indexed to the introduction and rules and schemes:

- the complexities of the site;
- the choice of equipment and fixed plant;
- the geotechnical measures;
- detailed information required by the Quarries Regulations and other relevant legislation.

Part 3 should contain instructions, rules and schemes (ie the practical measures that ensure safe working).

You do not have to repeat work done for other statutory authorities, as details will be the

the Health and Safety Document

same. For example the mineral planning authority under MPG5 requires the same geotechnical design criteria as the Quarries Regulations. Ensure that both authorities are satisfied by one indexed, comprehensive appendix and refer to it in the introduction.

What needs to be in it?

The content of the document is set out in regulations 6, 7, 8, 9, 10 and 11-46 of the Quarries Regulations and the accompanying guidance and ACOP.

In essence it must address the design; the management structure and how the health and safety is co-ordinated; the instructions, rules and schemes; the competence and training of all personnel and the review procedure.

The details of this information come from the remaining Quarries Regulations and other relevant legislation, such as COSHH and the Noise, Management, Workplace and Manual Handling Regulations.

It describes all the measures the operator has taken or will take to design, operate and maintain the quarry to keep it safe and healthy.

How is competence demonstrated?

Competence can be expressed in terms of national standards such as NVQ/SNVQ and membership of professional institutes. It can also be by competent assessment. To remain competent you have to undertake continual professional development (life-long learning). Companies should have a policy on this and individuals should keep records. It is your commitment to a safe quarry.



Control tip and excavation risks

Who can look at it?

Anyone who works at or is affected by the quarry can look at the document. The safety committee will need to use it as part of their routine work, to improve risk assessments and control measures. Those carrying out specific work should be given the relevant parts and have the control measures explained to them.

Who can make changes?

The operator will be continually reviewing it, making changes and informing staff of them. The safety committee will discuss it as part of their inspection routine and may suggest changes. If these are not accepted, the operator has to write to the committee stating why the changes have not been implemented and this must be displayed for 28 days at the quarry.

Who forms the safety committee?

The committee can be formed by the majority of those who work regularly at the quarry, or the operator can do it for you. Either way it does not affect your rights to inspect the quarry, review the risk assessments and make suggestions for improvements to the health and safety document. As a member of a safety committee you are demonstrating continual professional development. The quarry safety committee have the most extensive rights of any workers in Britain and it is in your interests to use them wisely.

VEHICLE FALLS:

Every year, drivers are killed and seriously injured as a result of vehicles falling from stockpiles and tips. What steps can you take to stop this happening?

The health and safety document



Care needs to be taken where vehicles load and tip on stockpiles

The health and safety document should show how the tip or stockpile was designed, how it is to be built, the type of equipment that can be used safely on it, and how equipment is to be used.

Every tip or stockpile should be designed to ensure it is safe from movement and safe to build on or load from.

- Have you seen the design?
- Has the tip/stockpile been built according to it?
- Are the rules for carrying out work safely suitable for the type of tip/stockpile being built?
- Do these rules give the drivers enough information to work safely?

When carrying out an inspection of a tip or stockpile, either as part of the daily inspection scheme or as part of the workman's inspection, what should you look for?

What should the design address?

How tips and stockpiles are built depends on what materials it is to be built from, what shape it will be, what it will be built on and how much water it will contain. These factors will influence how stable and safe the tip/stockpile is to work on.

Information on the nature of the materials to be used comes from the geotechnical specialist, who can then say what shape can be built, whether the foundations are suitable and how the tip or stockpile will be drained. The inspection and maintenance scheme is drawn up with the geotechnical specialist to ensure that the scheme is suitable for the tip/stockpile and that the management, supervisors and workforce know what to do if something goes wrong. Factors to consider and discuss with the specialist include:

- Are dust or wet materials being tipped?
- Is the tip being excavated and tipped on?
- Do vehicles go near the edge of the tip and is edge protection in place? Can vehicles approach edges safely without causing them to fail?
- Does the method of construction minimise the risks to those who work on the tip eg by building in layers instead of advance face tipping?
- Are all drains kept open and maintained? Do they prevent water flowing over the face of the tip?
- Does someone need to measure the water levels in the tip?
- What are the effects of heavy rain and a rise in water table on the tip?

It is important to keep the geotechnical specialist informed about any changes to the tip/stockpile.

tips for vehicles on tips

What should you look for in particular?

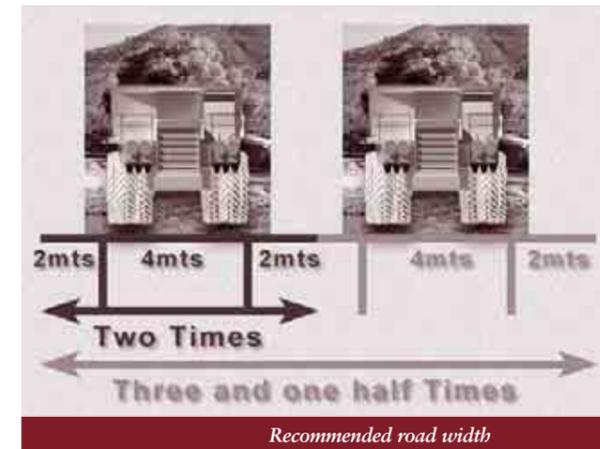
■ **Position of edge protection.** The nature of the material being tipped will decide how close a machine can approach the edge and therefore where the edge protection should be placed. How many tips have edge protection that falls away during the night and has to be rebuilt in the morning because it has not been placed on a firm foundation? The distance of the inner edge of the protection from the edge of the tip must be specified in the document and rules. The geotechnical specialist who designed the tip will decide this and it may vary if different types of materials are being tipped, or one conservative distance to suit different materials may be given at the outset.

■ **Height of edge protection.** The height of the edge protection will depend on the type of equipment being used, the speed of approach and the material the protection is to be built from. The minimum height will be 1.5 m (5 feet), or the radius of the largest wheel, whichever is the greater, and this will be adequate for slow approach speeds. Where vehicles approach at faster speeds, or on bends etc, the height may have to be three or four times the minimum to stop a vehicle.

If the material used to construct the edge protection is of a type that the height will decrease if it is hit, eg the height of a sand barrier will be reduced if it is bumped by a tyre, the height must be increased so that it is 1.5 m or the radius of the largest wheel *after* this shrinkage.

■ **Lighting.** Drivers must be able to see where they are going, particularly when tipping. Adequate lighting must be provided especially in the winter months when it may be dark at the start and finish of shifts.

■ **Access.** Roads should be wide enough for the vehicles using them: 2 x width on single-track roads and 3.5 x width on double-track roads. They must not be at a steeper slope than 1:10. This includes access on stockpiles.



Recommended road width

Suitability of equipment

The type of equipment that will be used is very important as each class of equipment has different needs for its safe use.

■ **Size and capacity of equipment.**

The equipment should be matched in size to the tip being built, and to other equipment eg the size of the bulldozer must be matched to the dump trucks.



Height of edge protection

WORKER REPRESENTATIVES:

If we are to reduce accidents and achieve the Hard Target then we must work together to improve the conditions at our own quarries. At your monthly safety meetings why not look at the issues below, compare the controls set out in the Health and Safety Document with those in your work place and ensure you work in a safe and healthy place?

Manual handling

Manual handling accounts for 27% of all accidents in quarries. If we are to achieve the Hard Target of cutting all accidents by 50%, then we have to address this issue.

Do you lift or move heavy loads?

The following is a guide to carrying out risk assessments of manual handling operations at quarries.

Do you handle bagged products?

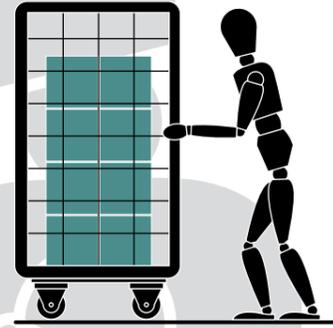
Use auto-bagging/palletising systems, lifting aids such as vacuum lifters, conveyors, and forklifts. If this is not possible, reduce the weight of the bags you use.

Do you handle drums?

Replace with bulk delivery systems, use large wheel trolleys designed to wheel and tip the drums with ease. Ensure that the ground surface is level so that the trolley can be moved easily.

How heavy is the material?

Use containers that restrict the amount of material to weights that can be easily handled, for example less than 20 kg. Wherever possible use machines for lifting and carrying.

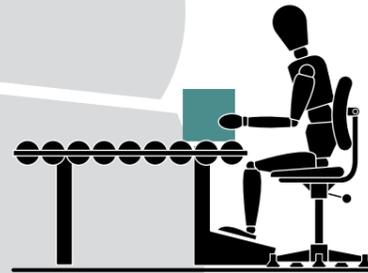


Do you have to push or pull loads?

Can they be moved by machine? Use trolleys with large wheels and well-maintained ground conditions.

Don't forget your stores and workshops

Do you have well-designed workstations with lifting aids such as tyre handlers?



Maintenance

Do you have good access? Has the machine been designed for ease of maintenance? Can you use lifting aids such as gantries, cranes or telehandlers?

Cleaning tasks

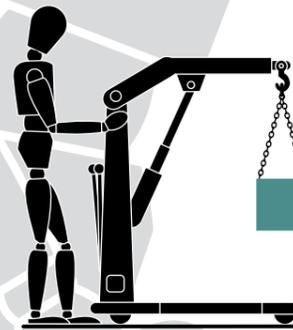
Design out the problem. Fit and maintain scrapers on conveyors, maintain enclosure hoods. Use vacuum/water/mechanical methods to move spillage.



Reduce accidents and ill health

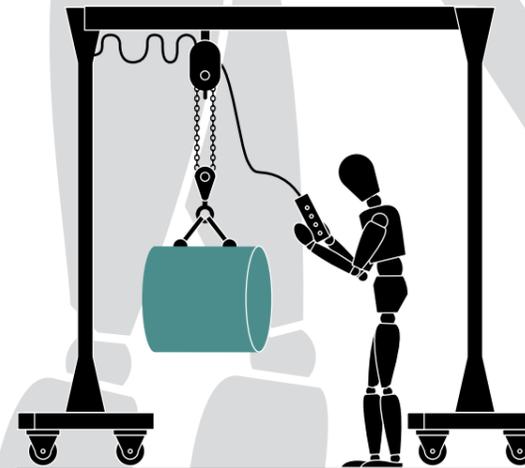
Carrying

Use the correct equipment. Hire it in if necessary. Cranes and telehandlers should be used. Wheel loaders should only be used if they are designed for material handling – the bucket is removed and proper handling devices fitted.



Awkward loads

These need special risk assessments to find out the best way of assessing the weight and lifting the load.



Falls from heights

Do you work on a quarry face?

You should not approach within 5 m of an unprotected face. The face edge protection should be put up before shotfiring operations begin, such as surveying, marking out the holes etc. If you cannot do this, then fall protection equipment must be worn until the face edge protection is erected.

Do you have to gain temporary access at height?

A ladder is only a means of access. If you are to work at height you must use an access system, for example scaffolding, MEWP or modified telehandlers.

Slips, trips and falls

What are the ground conditions like?

Use delineated access ways and keep them free of loose materials, with level drained surfaces. Clean up oil spillages etc. Salt routes in winter when ice is forming.

Do you have access to machinery and mobile plant?

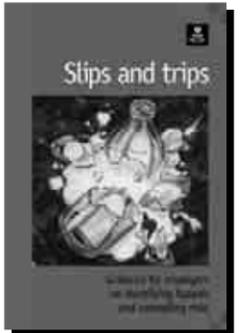
Always keep three points of contact when climbing on and off machinery. Ensure that the bottom step is well maintained and not bent or broken. Ensure that handrails are in good condition. Clean mud and debris off boots before climbing iron rungs. Do you have designated parking areas with access aids?

What condition are the access ways on fixed plant?

Keep them free of spillage and materials, practice good housekeeping. Are stairs and ladders well maintained and free from damage? Has the plant been inspected to ensure that there is no significant corrosion?

Is there sufficient lighting?

Is there adequate lighting, particularly in stairwells and dark sides of buildings?

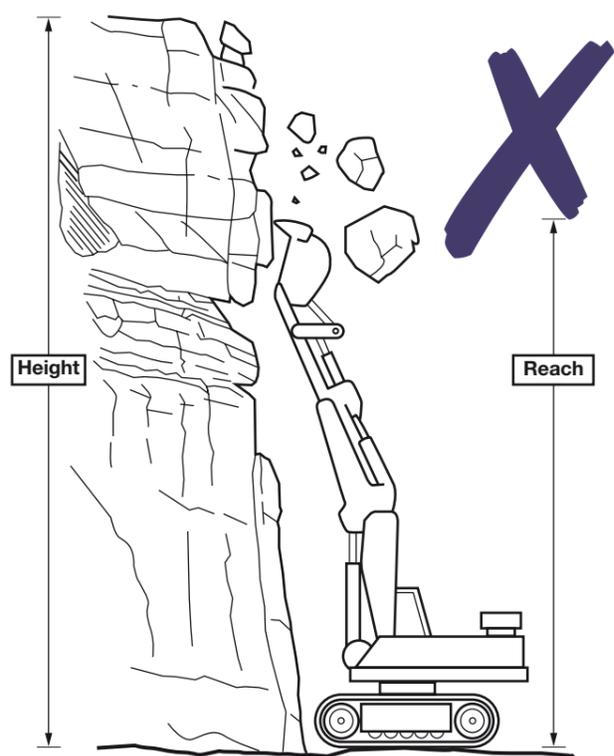
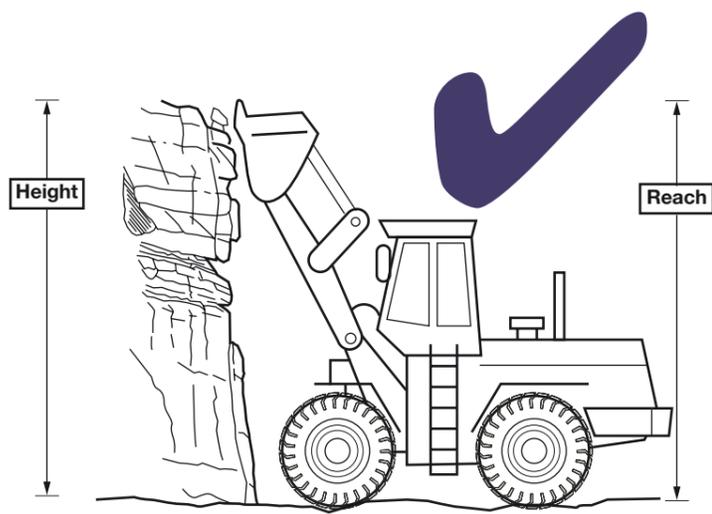
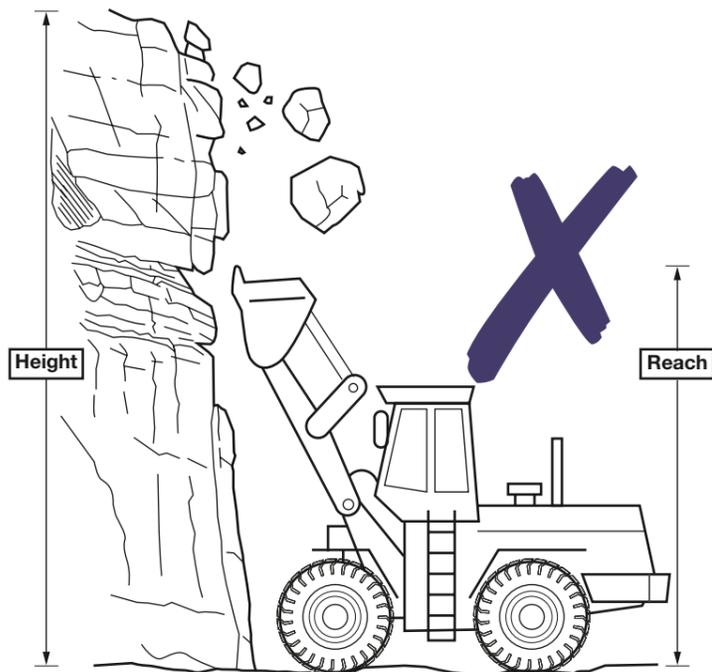


FACE THE FACTS: FACES

When considering the design of the quarry face you have to take account of jointing, bedding planes, faults, water pressure, clay and soft rock seams, weathering and voids.

You also need to think about damage you are doing through excavation with undercutting, stress relief and blast damage, the excavation system and the size of the equipment you have on site. In many cases the quarry faces are too high for the equipment used, and too high to minimise fly rock and the risk from falls of ground and personnel.

Some of the essential items you should address when selecting machinery are shown below. Faces that have potential for instability should be worked within the reach height of the equipment used, whether they are working in sand or hard rock. Typically, wheel loaders can reach 6-8 m and excavators 9-12 m. Larger mining shovels (120 tonne or more) are capable of reaching 18-20 m depending on how they are used.



ARE TOO HIGH FOR SAFETY!

Checklist for designing quarry faces

- Does the geotechnical assessment identify planar, wedge, toppling, rotational or any other type in bench failure mechanism or rock fall?
- Do you need a rock/sand trap? (If so, incorporate into design and rules.)
- Can the excavator/loader reach and capture material to the top of the face?
- Is the cab outside of rockfall/engulfment range? (It will need FOPs/ROPs.)
- Is the bucket sized to capture the largest rock?
- Is the loader/excavator and standing material stable?
- Is the bench wide enough for loading and long-term maintenance operations including access, drainage, scaling, stand-offs, edge protection and (where needed) rock/sand traps?
- Design faces, benches and stand-offs stipulating widths, heights and angles and size and type of loader/excavator. Write tip and excavation rules.

If you can't answer any of the questions above, ask your geotechnical specialist for further advice. Use the information from the geotechnical assessment to ensure that you are operating according to the quarry design, and act upon any requirements for safety of faces or tips within the necessary timescale.

