Paths for All

# Factsheet 5.5

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# Dealing with Hazards and Risk Assessment in Path Construction

Risk assessment is a fundamental part of health and safety management both for a path construction project and its ongoing management. Its main objective is to determine the preventative measures needed to comply with the Health and Safety at Work Act 1974, and other regulations in place to reduce the number of accidents, dangerous occurrences, and ill health at work.

The Management of Health and Safety at Work Regulations 1999 require all hazards at work to be identified and a risk assessment created to avoid the risks of hazards if possible, and to reduce and control remaining risks to acceptable levels, so no one is hurt, or off work for long time.

The Construction (Design and Management) Regulations 2015 require designers to identify risks with their designs, to remove them if possible, or reduce and control the remaining ones. If you are going to design a bridge, boardwalk, or path, or do actual construction work, risk assessment is one thing you must do to comply with the relevant health and safety regulations.

This factsheet will introduce you to the five steps in the risk assessment process, as follows:

1. Look for the hazards
2. Decide who might be harmed and how
3. Evaluate the risks and decide upon control measures
4. Record and communicate your findings
5. Review and revise the risk assessment.

This factsheet will take you through each of these steps in turn so that the logic of the process is clear. You will also be introduced to ‘Point of work risk assessment’, and some other risk control approaches, e.g. hierarchy of control, ERIC.

# Risk assessment terms

First, let us start by defining some terms that anyone carrying out a risk assessment should be familiar with.

**ALARP** - is short for ‘as low as reasonably practicable’, which describes the level to which people expect to see risks in the work place controlled.

**Accident** - an event, activity that results in injury, ill health, or fatality to person or persons, or damage to environment.

**Control** - a preventative measure that reduces the risk of the hazard to acceptable level, e.g. physically remove the hazard, replace material with less hazardous one.

**General principles of prevention** - the steps to take to avoid a risk or prevent the most serious of consequences of harm.

**Generic risk assessment** - an assessment covering the hazards inherent in the work activity and controls that must take place for that activity wherever it is undertaken

**Hazard** - anything that may cause harm to a person, persons, or damage to environment.

**Hierarchy of controls** - a system of controls (preventative measures) used to remove or reduce exposure to risks of hazards.

**Likelihood** - what is the chance (probability) that an accident will occur (certain, likely, possible, unlikely, highly likely or rare)?

**Point of work risk assessment** - a simple risk assessment carried out by competent person, e.g. site supervisor, to do final check for hazards in area of work (‘point of work’) and to confirm that all controls are in place before the work starts.

**Reasonably practicable** - balancing the level of risk against the measures to control the real risks in terms of money, time and trouble (effort). However, somebody does not need to take action if it would be grossly disproportionate (higher) to the level of risk.

**Risk** - the likelihood (chance) of someone being harmed by hazard and how serious the harm could be.

**Risk assessment** - a systematic process of looking at work activities and identifying hazards resulting from them. It is also about considering chance of harm occurring and consequences of accident happening from those hazards, and putting the two together to estimate the level of risk involved in the activities. Where risk levels considered unacceptable, e.g. high, the assessment will identify controls needed to reduce the risks to acceptable levels, as low as possible.

**Safe system of work** - a formal procedure that results from systematic examination of a task in order to identify all the hazards. It defines safe methods to make sure that hazards are removed and remaining risks reduced.

**Severity** - what will be the severity (consequences) of any accident happening? What harm may the hazard cause - minor or major injury or death? At one extreme, someone whose hit on the head by excavator bucket might be killed, whereas the consequences of someone not using a bowsaw correctly with their hand not protected by a glove might result in a cut.

**Significant risk** - a risk that is not trivial (insignificant) in nature but is capable of causing serious injury, illness or a fatality.

**Site specific risk assessment** - an assessment covering only hazards and controls of a work activity identified at one location.

**Qualitative risk assessment** - a process base on judgement that uses no numerical estimate or high, medium, low scale to quantify the risks of harm from hazards.

**Quantitative risk assessment** - a process that uses numerical estimate or high, medium, low scale to quantify the risks of harm from hazards.

# Step 1 – Look for the hazards

Hazard identification is something that will be ongoing throughout a path construction project.

The site survey will identify hazards, such as presence of overhead power lines, steep ground, wet marshy ground, that may cause significant risks to everyone doing the path construction.

The design prepared or modified by a designer at projects design stage will identify risks of hazards associated with materials and processes, and sequence of assembly, e.g. how to put together different parts of a bridge.

When the work is outdoors on site, more hazards can be encountered that will affect those doing the work, as well as those not doing the work, e.g. members of the public.

Identified hazards and their risks must be managed so no one is harmed. Therefore, the designer must try to remove any risks that appear with the design if possible, and reduce the risks that cannot be designed out. Contractors, who do actual work created by the design, need to manage those remaining risks, as well as any new risks that develop as the work is carried out, or when changes with the design a peer.

**Hazards on a path project**

A lot of path construction involves simple groundworks on level or undulating terrain. In these circumstances, site hazards will generally be few and their risks not serious. But steep ground or wet, marshy ground may be present as well - these hazards present more serious risk. Nevertheless, it is important to be aware of the various kinds of hazard that can be met outdoors on site when doing path construction.

**Hazards posed by the physical environment**

For example:

- Working on or near to steep slopes
- Working on or near watercourses, wet marshy ground, or ground that floods
- Working near to public utilities, such as gas pipelines and underground or overhead electricity cables
- Working near disused mine shafts
- Working on or near contaminated ground
- Working on outdoor environments where wild animals carry and transfer diseases, e.g. Weils disease from rat urine, Lyme disease from deer ticks…

**Hazards posed by equipment and machinery**

Many of the hazards involved with path construction are those associated with the use of equipment and machinery in different situations. Here are some examples:

- The use of equipment with rotating blades
- The use of hand held power tools creating dust, noise, and vibration
- The use of excavators, dumpers, rollers working near workers or members of the public
- Use of cranes and other lifting equipment.

**Hazards posed by earthworks**

Path construction will involve excavation of the ground and moving materials to form earthworks. As well as hazards associated with the equipment to do the work, the earthworks, themselves create hazards.

- Excavations (borrow pits) collapsing
- Materials (earth, stone) collapsing.

**Hazards posed by work tasks on construction site**

Some typical hazards found on construction sites caused by work tasks are:

- Working at height with the potential for falls - falling off a bridge being built without a safe working platform
- Use of chemicals, solvents, paints, timber treatments and so on
- Manual handling of materials
- An untidy working area with trip hazards (hand tools lying on the ground)

# Step 2 Decide who might be harmed and how

Having identified the hazards, you now need to identify the individuals or groups of people who are at risk of harm. For example:

- Workers - labourers, machine operators, site supervisors, managers
- Workers who need special consideration - someone who is deaf or not fluent in speaking English
- Female workers - who are pregnant
- Visitors - clients, delivery drivers

- Anyone else who might be affected by your work - neighbouring businesses
- Members of the public - particularly young people (under the age of 18).

**Members of the public**

Consider members of the public who use the site as part of their normal daily life, e.g. walking the dog, cycling to school. Most members of the public will not be aware of the hazards and risks associated with path construction, so they must be treated as a high risk, especially if the nature of work activity is high risk, e.g. dumpers transporting stone along a route where space is tight for a dumper and people to pass. Young people in particular are high risk, as they have lack of hazard awareness.
Many path projects involve working on existing paths in different environments where members of the public will be present most days of the week. Whilst access rights do not apply to a construction site, it is good practice not to try to exclude people from the whole site, e.g. people should still be able to access the area of woodland where the work is not taking place. Instead, consider the following:

- Provide information signage at all access points' into a site, as well as at start of the route and visitor facilities, e.g. car park, visitor centre, stating what is happening, how long the work is expected to last and contact details for your organisation
- Where possible, you can provide a well-signed alternative route. Provide information on the same information signs (as above) about alternative route so the public know where to go
- If an alternative is not available then expect the public to access a site during works. The contractor must prepare and carry out a method statement ('safe system of work') that states how the work must be safely undertaken, when the public continue to use the route
- Clearly sign and mark working areas using site safety signage and barriers. It may be possible to exclude the public from small working areas for short periods with, ideally, a short diversion round the working area that is live
- The contractor should provide banksmen (a person trained to direct vehicle movement on or around site) to guide machine operators when the public is present, and to stop the public when a machine is moving around a site
- The contractor should provide banksmen to walk with and guide members of the public through the working area under their direct control. This safe system of work is particularly suitable on a high risk site where moving plant, e.g. dumpers, continue to travel backwards and forwards along the same route
- Most paths are busiest at the weekends, evenings, early mornings, so insist works only take place on Mondays to Fridays, between specific times. Avoid bank holidays as those days are extremely busy times
- Additional control measures may be necessary when considering the safety of people with disabilities, children, or visitors who may not understand signage written in English
- Where a path project is close to a school, a 'high risk site', contractor must take reasonable steps to secure the site, as it is their legal duty to do so under the Construction (Design and Management) Regulations 2015.

# Step 3 Evaluate the risks and decide upon risk control measures

Having identified the hazards, now evaluate the risks and consider what risk control measures are needed to keep from harm the people you have identified as being at risk from the path construction work.
Even when control measures have been put in place, there will usually be a remaining risk still. If you choose to use the risk assessment methods below to evaluate the risks, you will have to exercise your judgement as to whether the remaining risk is high, medium, or low.

This part of risk assessment is a loop. If, after identifying risk control measures, you think that the level of remaining risk is still too high, you will need to introduce more control measures. To do this you will need to re-evaluate the level of risk with remaining risk and continue the process until you feel it is acceptable. It is a case of you asking yourself this question: What have I done to control the risk and what more do I need to do?

**Evaluate the risks**

There are two risk assessment methods used to evaluate and consider the risk of something going wrong in terms of likelihood (chance/ probability) and severity (consequences). One method attempts to quantify the level of remaining risk by multiplying likelihood and severity risk rating scores together, whilst the other does not, but the process is still the same. Here we explain both methods.

- **Quantitive risk assessment**

This risk assessment method gives a residual risk a numerical risk rating score or 'high', 'medium', 'low' risk rating category to enable control measures to be prioritised.

**Here is a numerical risk rating scoring system:**

The likelihood of a hazard actually causing harm or an accident is rated as being **3** = **Highly likely**, **2** = **Likely**, and **1** = **Unlikely** in accordance with the following criteria:

**3** = **Highly likely**: happens regularly or could be a usual or common occurrence

**2** = **Likely**: less regular, but still recognised as likely to happen

**1** = **Unlikely**: not happened for a long time, known to be infrequent, not likely to happen

The severity of the harm caused by hazard should it happen can then be categorised with the following criteria:

**3** = **Major injury**: result could be a fatal accident or multiple injuries to person or persons

**2** = **Moderate injury**: probably cause serious injury to person or persons would be off work for over seven days due to injuries

**1** = **Minor injury**: minor injury to person or persons

1. Likelihood and severity are put on a matrix as shown below.

| Likelihood (chance) of harm occurring | | | | |
|---|---|---|---|---|
| | Highly likely | 3 | 3 | 3 |
| | Likely | 2 | 2 | 3 |
| | Unlikely | 1 | 2 | 3 |
| | | Minor injury | Moderate injury | Major injury |
| | | Severity (consequences) of harm | | |

2. The work activity likelihood is assessed as **3** = **highly likely** and severity is assessed as **2** = **moderate injury**, the risk rating is **X** on the matrix, as shown below.

| Likelihood (chance) of harm occurring | | | | |
|---|---|---|---|---|
| | Highly likely | 3 | X 3 | 3 |
| | Likely | 2 | 2 | 3 |
| | Unlikely | 1 | 2 | 3 |
| | | Minor injury | Moderate injury | Major injury |
| | | Severity (consequences) of harm | | |

3. The likelihood risk rating score of **3** = **highly likely** is then multiplied by the severity risk rating score of **2** = **moderate injury** to give risk rating score of **6** (3 x 2 = 6), which is a medium risk, as shown below.

| Risk level | Risk rating score | Action |
|---|---|---|
| **Low** | 1 - 3 | Broadly acceptable (least risk) – no action required |
| **Medium** | 4 - 6 | Moderately acceptable (tolerable) – action required to reduce risk if reasonable steps possible |
| **High** | 7 - 9 | Unacceptable (greatest risk) – action must be taken immediately to reduce risk |

There are a number of points to watch if using this risk rating scoring system. The main problem is that an incident with a high Likelihood risk rating and a low Severity risk rating scores the same overall risk rating as an incident with a low Likelihood risk rating and a high Severity risk rating. So the risk rating for example of a group of volunteers cutting back shrubs (high likelihood of someone having a minor cut, but low severity) is the same as that for an excavator tipping over on steep ground and crushing a banksman (low likelihood, but high severity).

To avoid this, an alternative way to assess risks is to use a 'high' 'medium' and 'low' risk rating system. Using this method avoids confusion of what a risk rating number means, and gives an instant indicator on how dangerous or otherwise a work activity may be.

**Here is a 'high' 'medium' and 'low' risk rating system:**

The likelihood of a hazard actually causing harm or an accident is rated as being **High**, **Medium**, and **Low** in accordance with the following criteria:

**High**: happens regularly or could be a usual or common occurrence

**Medium**: less regular, but still recognised as likely to happen

**Low**: not happened for a long time, known to be infrequent, not likely to happen

The severity of the harm caused by hazard should it happen can then be categorised with the following criteria:

**High**: result could be fatal accident or multiple injuries to person or persons

**Medium**: probably cause serious injury to person or persons would be off work for over seven days due to injuries

**Low**: minor injury to person or persons

1. Likelihood and severity are put on a matrix as shown below.

| Likelihood (chance) of harm occurring | | | | |
|---|---|---|---|---|
| | High | | X | |
| | Medium | | | |
| | Low | | | |
| | | Low | Medium | High |
| | | Severity (consequences) of harm | | |

2. The work activity likelihood is assessed as **High** and severity is assessed as **Medium**, the risk rating is marked **X** on the matrix, as shown below.

| Likelihood (chance) of harm occurring | | | | |
|---|---|---|---|---|
| | High | | X | |
| | Medium | | | |
| | Low | | | |
| | | Low | Medium | High |
| | | Severity (consequences) of harm | | |

3. The combined likelihood and severity risk rating is then scored by taking the higher of the two individual ratings, which is **High** as shown below.

| Likelihood (chance) of harm occurring | | | | |
|---|---|---|---|---|
| | High | High | High | High |
| | Medium | Medium | Medium | High |
| | Low | Low | Medium | High |
| | | Low | Medium | High |
| | | Severity (consequences) of harm | | |

- A combined risk rating of **High** should not be unacceptable level of risk and the work activity should not be carried out until the risk has been reduced.
- When there is a combined risk rating of **Medium**, action must be taken and the work activity stopped, if necessary, to reduce the level of risk.
- If the combined risk rating is **Low**, it is acceptable to start the work activity as long as everything reasonable and practically has been done to reduce the risk, and the assessment is reviewed at regular intervals.

You can now make decisions on whether it is sufficiently safe to continue with a work activity, or if more control measures are needed to make the work safe.

# Example

Here is example part of a quantitive risk assessment of a hazard associated with installing a bridle gate at end of a path close to a pavement.

| | | |
|---|---|---|
| **Work activity** | Excavating post holes for bridle gate installation | |
| **Persons at risk** | Volunteer workers carrying out the job | |
| **Hazard no. 1** | Accidental contact with underground service cables | |
| **Risk control measures** | • Carry out pre-excavation ground survey with cable voidance tool scanner<br>• Contact utility company to request a site visit<br>• Examine site service plan before digging | **Owners of the risks/ date by which actions must be taken**<br>Works supervisor, 22 |

| | | | | |
|---|---|---|---|---|
| | • Use hand tools with insulated handles for digging | | | May 2015 |
| **Risk rating** | **High** | **Medium** | **Low** | **Combined risk rating** |
| **Likelihood of harm** | | | X | Low |
| **Severity of harm** | | | X | |

- **Qualitative risk assessment**

The qualitative risk assessment method is much the same as quantitive approaches above but there is no attempt to quantify the level of residual risk - no numerical risk rating score or high, medium, low risk rating used.

# Example

Again, here is example part of a qualitative risk assessment of same hazard above that does not include numerical risk rating score or high, medium, low risk rating.

| **Work activity** | | Excavating post holes for bridle gate installation | | | |
|---|---|---|---|---|---|
| **What are the hazards?** | **Who might be harmed and how?** | **What are you already doing?** | **What further action(s) is necessary?** | **Action by who?** | **Action by when?** |
| Accidental contact with underground service cables | Workers hitting cable with tools | Carry out pre-excavation ground survey with cable voidance tool scanner<br><br>Contact utility company to request a site visit<br><br>Examine site service plan before digging<br><br>Use hand tools with insulated handles for digging | Ongoing briefings at start of each work day to include warning about working safely where underground cables are present | Works supervisor | Before date of starting work on site |

**Decide upon control measures**

The control measures are minimum requirements to making sure the remaining risks are reduced as low as reasonably practicable to prevent anyone being harmed. Where controls fail to reduce the risk to an acceptable level then that is a bigger issue!

When establishing appropriate control measures, you should consider ‘general principals of prevention’, when preparing or modifying a design for path construction. The general principals of prevention are a ‘precautionary principle’ process based on a target-setting

checklist of control techniques. It is a health and safety framework for consideration of construction design management issues rather than a strict hierarchy of controls.

The first priority is to avoid risks. If the hazard cannot be avoided, you must reduce it as much as possible by applying the following principles, if possible in this order (examples of how you might apply them in practice are given for each control technique):

1. Avoid risks - ask yourself, can I get rid of the problem (or hazard) altogether?

   For examples:

- A bridge could be designed so it can be assembled on the ground and then lifted into position across a watercourse with a crane or large excavator to remove the risk of workers falling off when working at height
- A bridge could be designed with a high handrails to remove the risk of a horse rider falling off the bridge
- The end of a path could be positioned away from a material storage area, so workers and moving plant are separated when the path is being built
- Design the drainage feature using a piped culvert under the path to remove the risk of users tripping over an open cross drain installed in the path surface

2. Evaluating the risks you cannot remove

   For examples:

- Work out whether the effort, time and expense of installing a high handrail on a bridge is appropriate, if the bridge is only occasionally used by horse riders and the distance to fall is not far, and the risk of a rider falling of the bridge can be reduced using a lower handrail
- Work out whether the effort, time and expense of installing anti-slip surfacing materials on a new boardwalk is appropriate, if the risk of someone slipping over can be prevented by carrying out regular maintenance - brushing off any loose or built up debris on the decking to stop it becoming wet and slippery

3. Combating the risk at source

   For examples:

- Arrange for overhead power line to be isolated (electricity switched off), if possible with the service provider
- Use a safer product rather than rely on personal protective equipment/ clothing

4. Adapting the work to the individual - this one relates mostly to buildings, not particularly paths!

5. Adapting to technical progress - consider new techniques or technologies, and adopt new, safer methods of working

   For examples:

- Prefabricating parts of a bridge off site
- Specifying bridge or boardwalk decking boards with suitable slip resistant surfacing to stop people slipping on constantly wet surface
- Use on tool dust extraction when cutting concrete kerbing

6. Replace the dangerous with the non-dangerous or the less dangerous - provide a less risky option

   For examples:

- Use stone to pitch a path or install steps that is lighter in weight
- Substitute solvent based products with water based ones
- Use untreated instead of treated timber
- Use recycled tyre kerbing instead of heavy concrete ones
- Use recycled plastic instead of treated timber
- Use only 110 volt or battery powered tools (prohibit the use of all 230 volt power tools)

7. Adopt and give collective protective measures priority over individual measures that protect the greatest number of people

   For examples:

- Make provision for segregated routes so that barriers can be provided between pedestrians and moving traffic
- Safety net under a bridge protects everyone working above, whereas a safety harness only protects the individual person

8. Give appropriate information, instructions, and training to everyone carrying out the work – providing residual risk information on drawings is a powerful safety communication tool

   For examples:

- Use symbols and/ or written information on drawings, plans, or instructions such as intended sequencing of assembling prefabricated parts of a bridge that may be unknown to those tasked to put them together
- Give working at height training to workers working on bridges

9. Provide personal protective equipment/ clothing but always as the last resort.

The control techniques, you use depend upon the nature and severity of the risks. Decide what is reasonably practicable. In many cases, a combination of techniques are best used together to manage the risks.

Note that removing a hazard may present additional hazards! For example, if asbestos waste were discovered on site (all too common in brown field sites), removing it to protect workers and path users will require special asbestos training. Consider a reasonably practicable way of dealing with the high risk work activity, so that the risk is controlled as low as reasonably practicable. Balance cost, time, and effort on one hand against the chance and consequence of harm happening from the risk on the other hand.

**Other health and safety frameworks to help decide upon control measures**

Here we show you several other health and safety frameworks used to consider and decide on control measures for reducing risks.

**Hierarchy of control**

Risks reduced to the lowest reasonably practicable level by taking preventative measures, in order of priority. This is a hierarchy of control. The hierarchy of control is a system

used to eliminate and reduce exposure to hazards. It is promoted as standard risk control practice for risk assessment in the workplace. The list of controls below set out the order to follow when planning to remove and reduce risks you have identified in your workplace.

Consider the headings in the order shown, do not simply jump straight to the easiest, least effective control measure to implement, which is personal protective equipment at bottom.

1. Elimination - physically remove the hazard if possible - this is most effective control measure
2. Substitution - replace the material or process with a non-hazardous or less hazardous one
3. Engineering controls - isolate people from the hazard. For example, use work equipment to prevent falls where you cannot avoid working at height, install or use additional equipment to control risks from dust or isolated the hazard from workers by methods such as enclosing or guarding dangerous items of machinery/ equipment. Give priority to measures which protect people collectively over measures that only protect an individual person.
4. Administrative controls – change the way people work to keep them safe. For example, reducing the time workers are exposed to hazards, e.g.by job rotation, prohibiting use of mobile phones in hazardous areas, increasing safety signage, and doing risk assessments, etc.
5. Personal protective equipment (PPE) - this is least effective control measure. Protect the worker with PPE, including clothing, only after all the previous measures have been tried and found ineffective in controlling risks to a reasonably practicable level, must PPE be used. For example, where you cannot eliminate the risk of a fall, use work equipment or other measures to minimise the distance and consequences of a fall (should one occur). If chosen, PPE should be selected and fitted by the person who uses it. Workers must be trained in the function and limitation of each item of PPE.

**ERIC**

ERIC an acronym for Eliminate, Reduce, Inform - Control. ERIC is sequence of actions for design risk assessment process under the Construction (Design and Management) Regulations 2015, used by designers to eliminate the risks, if possible, with designs, reduce the risks that remain, and to inform others of those risks, who need to know about them, by providing relevant health and safety information. The separating line between Inform and Control emphasises that once a designer has passed on appropriate information to the client (or principal designer on projects with more than one contractor involved), the control of the resulting risks then belong to someone else, e.g. another designer or contractor.

**Control measures for working at height**

Work at height is a high risk working activity and is relevant to any place of work where, if there were no precautions in place there, a person could fall a distance liable to cause injury. For example, a fall off a bridge being built across a watercourse.

For working at height, you must make sure work is properly planned, supervised, and carried out by competent people with the skills, knowledge, training, and experience to do the job. You must use the right type of equipment for working at height.

Take a sensible approach when considering control measures. Low risk, relatively straightforward tasks will require less effort when it comes to planning and there may be some low risk situations where common sense tells you no particular precautions are necessary.

First assess the risks by carrying out a risk assessment of the work at height. Factors to weigh up include the height of the task, the duration and frequency, and the condition of the surface being worked on.

Go through these simple steps as part of assessing the risks:

- Can you **avoid** work at height in the first place, if it is reasonably practicable to do so? If no, go to prevent
- Where work at height cannot be easily avoided, can you **prevent** a fall from occurring using either an existing place of work that is already safe or the right type of work equipment? If no, go to minimise
- Can you **minimise** the distance and/ or consequences of a fall by using the right type of work equipment, where the risk cannot be eliminated?

For each step, always consider control measures that protect everyone at risk (collective protection) before measures that only protect the individual (personal protection).

Personal protection is work equipment that requires the individual to 'act' for it to be effective. An example is putting on a safety harness correctly and connecting it, with an energy-absorbing lanyard, to a suitable anchor point that is not directly on the structure being worked on.

Collective protection is work equipment that does not require the person working at height to act for it to be effective. Examples are permanent or temporary guardrails, scissor lifts, tower scaffolds, scaffold, and mobile elevated working platform.

More information on working at height take a look at Health and Safety Executives 'Working at height – A brief guide'.

**Control measures for physical health hazards**

Path construction involves many physical health hazards, such as noise, vibration, manual handling, and repetitive work. You will find more information about controlling those hazards on Health and Safety Executives website 'Controlling physical ill health risks'.

# Step 4 – Record and communicate your findings

Having gone through the risk assessment process, the next challenge is to communicate your findings so that workers doing the work can easily follow procedures to avoid hazards. If you have five or more employees, recording your findings is a legal requirement. However, even if you have less than that, you may find it easier to manage if you have your findings written down. Obviously members of the public will not read a risk assessment - they should be made aware of hazards by the use of safety signs, information notices, and barriers.

The level of detail in a risk assessment should be proportionate to the risks. If there are no risks or the risks are low, then the level of detail required is minimal. Concentrate on medium and high risks as these may kill or injure people.

The Management of Health and Safety at Work Regulations 1999 does not say how a risk assessment should be laid out, although two common practices have developed over time.

- Quantitive risk assessment - outlines hazards, person at risk, control measures, owners of the risk control measure actions, a date by which action must be completed, and the remaining risks are given numerical risk rating score or high, medium or low risk to enable actions to be prioritised.

- Qualitative risk assessment - much the same as a quantitive risk assessment, but no numerical risk rating score or high, medium or low risk given to quantify the level of risk remaining with hazards.

Samples of both types of risk assessment are included at end of this factsheet, as part of full example of whole risk assessment process.

A golden rule for communicating risk assessment findings is to keep it simple, as it is not about producing paperwork that may get ignored. A useful exercise is to produce a method statement that reflects the findings of the risk assessment for the same work. The control measures selected for controlling risks will influence the method of carrying out the work.

# Step 5 – Review and revise the risk assessment

The fifth and final step involves a review of the risk assessment and if necessary, updating. This is also a legal requirement. A review of a risk assessment should be carried out from time to time to make sure the control measures are still appropriate and effective. And if there is a change to the way the work has to be carried out, that might affect health and safety of those doing it. For example:

- Using a different item of work equipment part way through the work
- The arrival of new workers on site
- A change in weather or site conditions
- The late arrival of materials.

Health and safety regulations require that all risk assessments must be suitable and sufficient. Work supervisors given risk assessments by their employer can check and question the suitability of an assessment before accepting it - they can question anything that does not seem to be right - if in doubt they have right to ask!

# Full example of whole risk assessment process

Here is a typical example of a significant hazard associated with the route of a path, identified at the time of the path survey. The existing narrow path follows a river through a steep sided gorge.

**Work activity**

Constructing a benched aggregate path with tracked excavator, dumpers, and a roller.

**Step 1 - Look for the hazards**

The significant hazard, we must consider is:

- Steep drop into a river alongside the working area

**Step 2 - Decide who might be harmed and how**

In this case, we must consider:

- Operators of excavator, dumpers, and a roller

The risk, we must consider:

- Plant tipping over, rolling down the slope, into the river

**Step 3 - Evaluate the risks and decide upon risk control measures**

Risk rating is **high** due to the likelihood of serious injury or death if a plant operative is crushed by plant that has tipped over and rolled down the slope.

**Hazard elimination measures**

**Option 1 -** Do not carry out any work on this section of the path

- Pros - Successfully avoids the hazards
- Cons - Strong local demand for an improved path, intolerable erosion and damage to a sensitive site without the work going ahead
- Conclusion - Those not willing to actively manage the risks associated with a project often use this option as a “get out”. However, it must be considered.

**Option 2 -** Avoid the hazard by redirecting the path on an alternative route to avoid the river valley altogether.

- Pros - This would successfully avoid the hazard
- Cons - Difficulties in negotiating more land, possible increased problems and hazards with other routes, the river is one of the key attractions for the route and people will use it anyway with the problems noted above
- Conclusion - This option is possible but undesirable, less attractive to users, potentially very expensive and potentially will not solve the original management issue.

**Note: None of the above measures are reasonably practicable, given the nature of this hazard we therefore look to reduce the risk so that the hazard becomes acceptable.**

**Hazard reduction measures**

**Option 1 -** Avoid the worst areas of the steep ground, arrange for plant access at other locations on the site to minimise the need for dumper passes through the dangerous working area.
Pros - A realistic and cost effective solution that could reduce the risk to an acceptable level.

Cons - Other access will have to be negotiated, the hazard is not totally eliminated.
Conclusion - An option worthy of consideration provided other access is available.

**Option 2 -** Use plant operators who are trained and experienced in working on and near steep ground.
Pros - Simple to manage and implement.
Cons - The hazard is still present in its original form.
Conclusion - This solution relies on the 'human factor'. Even competent trained operators can make mistakes. This is not an ideal solution in isolation.

**Option 3 -** Install warning signs and safety barrier fencing to indicate the dangerous working area. Formulate a safe system of work so that banksmen will be on hand to guide and control operators working in the dangerous working area.
Pros - If effective, this will reduce the hazard to an acceptable level.
Cons - Relies on operatives following safe system of work procedure
Conclusion - This could be a good option but still not ideal as the hazard has not been treated at source.

**Option 4 -** PPE - Use plant with roll over protection system.
Pros - This will reduce the effects of an accident, possibly to an acceptable level.
Cons - It has not stopped an accident from happening, injuries may still occur, still requires safe systems of work, and relies on operatives using correct PPE in the correct manner.
Conclusion - This could be used in conjunction with other reduction measures but not acceptable on its own - PPE is the last resort.

**Solution**

Thoroughly survey the site and investigate all possibilities for avoiding the worst of the steep ground / drops. Work with contractor to plan haulage operations such that this section is used as little as possible for material hauling – formulate a method statement as a safe system of work so that dumpers do not meet on the dangerous working area. Choose suitable plant and competent trained operators capable of working on or near steep ground. Provide information, signs and instructions so that all plant operatives on site are aware of the hazards and how to proceed through the dangerous working area.

In other words, we have used a combination of the above hazard reduction measures to provide a safe system of work. The hazard has not been totally eliminated but with careful management, a safe working environment can be achieved with minimum cost. This example is also an excellent example of how the Construction (Design and Management) Regulations 2015 should be used to manage health and safety. So the first two options, elimination and reduction of the risks would be tackled at the design stage with any residual risk left to the contractor to manage.

**Step 4 - Record and communicate your findings**

For a site like this you would communicate the hazard and the risk management procedures in several ways. The designer would have highlighted where the dangerous working area is on a site plan, which went into the tender document as part of pre-construction information, with a clear indication of where the dangerous working areas to be avoided are, and where the new path is to go. The designer and principal designer (if involved) would discuss the hazard as part of the design process. The designer (or principal designer) would discuss the issue with the contractor at the pre-start meeting to

make sure they are aware of the hazard and the need to manage it throughout the construction phase. The contractor, as well as having written risk assessment, will need to provide a suitable safe system of work – method statement – for dealing with dumpers passing through the dangerous working area. The method statement would need issuing to all plant operatives. Safety warning signs would also be placed at suitable locations warning all plant operatives of dangerous working area and the steep drop. Safety barrier fencing would also be installed to keep dumpers, other workers and members of the public away from the steep drop. Regular site meetings will highlight the effectiveness of these control measures and to determine whether other precautions are required. Place information signs at all access points to warn members of the public about the path construction. Provide diversions around the dangerous working area with banksmen and, if a closure is unavoidable schedule it for times when the path gets the least use.

**Step 5 - Review and revise the risk assessment**

As the works progress, any additional hazards will be identified, assessed and suitable control measures put in place to manage them. The effectiveness of the existing control measures should also be assessed and if necessary, new control measures implemented. It is essential for the contractor to encourage their supervisors and workers to feedback on the suitability of risk assessment so they can be reviewed effectively.

# Sample risk assessments

These samples show layout of quantitive and qualitative risk assessments for the above full example of whole risk assessment process.

**Sample of a quantitive risk assessment**

| | | | |
|---|---|---|---|
| **Organisation name** | | | |
| **Project name** | | | |
| **Project location** | | | |
| **Assessment date** | **Assessment review date** | **Name and contact details of assessor** | **Assessment number** |
| | | | |

| | | | | |
|---|---|---|---|---|
| **Work activity** | Constructing a benched aggregate path | | | |
| **Persons at risk** | Plant operatives carrying out the work | | | |
| **Hazard no. 1** | Steep drop into a river alongside the working area | | | |
| **Risk control measures** | • Plant access arranged at other site locations to avoid the need for dumpers to pass through the dangerous working area<br>• Plant only suitable for working on and near steep ground being used to carry out the work<br>• Only competent operatives trained and experienced in working on and near steep ground operating the plant<br>• All plant operatives are assessing the steep ground and weather conditions before starting work and monitoring conditions throughout the day<br>• Site layout plan with hazard warning symbol and text 'Dangerous Working Area - Steep Drop' issued to all plant operatives<br>• Banksmen being used to guide and control dumper operatives through the dangerous working area<br>• Warning signs installed at the dangerous working area to indicate steep drop<br>• Safety barrier fencing installed along the dangerous working area to keep plant a safe distance from the steep drop<br>• Only excavators, dumpers, rollers fitted with rollover protection system are being used to carry out the work | | | **Owners of the risks/ date by which actions must be taken**<br><br>Site supervisor/ manager<br><br>Before date of starting work on site |
| **Risk rating** | **High** | **Medium** | **Low** | **Combined risk rating** |
| **Likelihood of harm** | | X | | High |
| **Severity of harm** | X | | | |

**Sample of a qualitative risk assessment**

| | | | |
|---|---|---|---|
| **Work activity assessed** | Constructing a benched aggregate path | | **Page 1 of 1** |
| **Organisation name** | | **Assessment date** | |
| **Organisation address** | | **Assessment by (print name)** | |
| **Site address (location)** | | **Assessment review date** | |

| What are the hazards? | Who might be harmed and how? | What are you already doing? | What further action(s) is necessary? | Action by who? | Action by when? |
|---|---|---|---|---|---|
| Steep drop into a river alongside the working area | Plant operatives carrying out the work:<br><br>Plant tipping over, rolling down the slope, into the river. | • Plant access arranged at other site locations to avoid the need for dumpers to pass through the dangerous working area<br>• Plant only suitable for working on and near steep ground being used to carry out the work<br>• Only competent operatives trained and experienced in working on and near steep ground operating the plant<br>• All plant operatives are assessing the steep ground and weather conditions before starting work and monitoring conditions throughout the day<br>• Site layout plan with | Ongoing briefings at start of each work day to include warning about working on and near steep ground | Site supervisor/ manager | Before date of starting work on site |

| | | | | | |
|---|---|---|---|---|---|
| | | hazard warning symbol and text ‘Dangerous Working Area - Steep Drop’ issued to all plant operatives<br>• Banksmen being used to guide and control dumper operatives through the dangerous working area<br>• Warning signs installed at the dangerous working area to indicate steep drop<br>• Safety barrier fencing installed along the dangerous working area to keep plant a safe distance from the steep drop<br>• Only excavators, dumpers, rollers fitted with rollover protection system are being used to carry out the work | | | |

# Point of work risk assessment

Generally employers risk assessment is not prepared on first day of work starting on site, so if you are the work/ site supervisor, you must make sure that the risk assessment is correct before starting work. A simple 'point of work risk assessment' could be carried out for this task, which could be based on this STAR principle: Stop, Think, Act, and Review.

Before you start work:

- **Stop** and **Think** about where you are working and what you are tasked to do
- If safe to continue you can start work, or else **Act** to make it safe
- When you have finished the work **Review** what has been done
- If anything good or bad was learnt whilst doing the work, report your findings back to your employer for improvement next time.

For sample point of work risk assessment form, refer to 'Checklists and form' section of the CITB Construction Safety Companion website.

| **More information about risk assessment** |
|---|
| See Health and Safety Executive's website at 'Risk management'. |

| **Important note** |
|---|
| This factsheet has been compiled using the best information available to Paths for All at the time of publication. It is intended as a general guide to the topic and should not be viewed as a substitute for expert advice and professional guidance. |

| **Other publications** |
|---|
| See Paths for All's website at www.pathsforall.org.uk |

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