



HEALTH AND SAFETY
AUTHORITY

Safe Quarry

A Guide for Quarry Workers



Our Vision:
Healthy, safe and
productive lives
and enterprises

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This Guidance has been developed by the Quarry Safety Partnership



QSP

Quarry Safety Partnership

The Quarry Safety Partnership is a Tripartite Committee with the mission of promoting, developing and encouraging safety and health in the Quarrying and Construction Products industries

The QSP is comprised of members from the Health and Safety Authority (HSA), Irish Concrete Federation (ICF), Irish Mining and Quarrying Society (IMQS), Irish Congress of Trade Unions (ICTU/SIPTU), Engineers Ireland (EI) and SOLAS.

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What is a quarry?

A quarry is a place where sand, stone or gravel is extracted, processed and sold.

Quarries are essential to the Irish economy. They provide raw materials and specialist products for use in the construction industry, civil engineering projects and agriculture. Products such as cement, precast items and building materials generate export revenue.

Quarries vary greatly from small operations to large pits excavating large amounts of material and include a number of manufacturing plants. Although there are often a greater number of hazards at larger quarries, you may be at more risk at a smaller operation – depending on how well safety, health and welfare matters are controlled at the quarry.

Every quarry must have an Operator. The Owner must appoint the Operator of the quarry. At most quarries the Owner is the Operator and is self-appointed. The Operator must be competent and have the necessary resources to operate the quarry.

This booklet highlights some of the risks that quarry workers may encounter at work and explains how they should be addressed.



What risks am I exposed to at work?

You may be exposed to a number of safety, health and welfare risks due to the physical and health hazards typically found in quarries.

Physical hazards

Quarry workers are often exposed to hazards by the normal, everyday events that take place in quarries. For example, excavating and processing stone or sand generally involves:

- a high number of vehicle movements,
- the operation of crushing, screening and sizing equipment,
- work at height,
- getting in and out of large vehicles,
- risk of collapse of the sand or stone face,
- working on or near water, and
- the use of explosives.

Each of these activities involves a degree of risk.



Health hazards

Quarries are often noisy, dusty places and some of the work can be very physical. Such factors may expose quarry workers to an increased risk of:

- hearing loss,
- respiratory disease, and
- musculo-skeletal injuries such as back injury.

Back injury can also be caused or aggravated by whole body vibration from the operation of vehicles, particularly when they run on poor quality surfaces.

Operations such as concrete manufacturing can bring workers into contact with chemicals and sensitisers (substances that can cause an allergic reaction over time). Such exposure increases the risk of:

- dermatitis, and
- asthma or other respiratory problems.



How do I raise any safety, health and welfare issues I may have?

You can raise a safety, health or welfare issue directly with your employer or through a third party, such as a safety representative or union representative, who will act on your behalf.

Employers

Every worker has the right to make representations to and consult their employer on matters relating to safety, health and welfare at work.

The employer must consider the representation and, where necessary, take appropriate action. It is up to the employer to decide what, if any, action needs to be taken in relation to the representation.

Usually workers raise issues directly with their supervisor or with the quarry manager.

If there is a safety committee, workers can ask for their issue to be put on the agenda for the next meeting. Workers can also ask to participate in the safety committee.

Safety representatives

A group of workers at a quarry can select one worker to act as the group's safety representative.

Workers can ask their safety representative to make a representation on their behalf on any issue relating to safety, health and welfare.

A safety representative is entitled to investigate complaints, accidents and make inspections at the quarry.

Safety representatives may accompany Health and Safety Authority (HSA) inspectors when they are carrying out an inspection.

Union representatives

If a quarry is a unionised workplace, the elected union representative or the local union official can make representations on behalf of that trade union's members.



How do I raise any safety, health and welfare issues I may have?

A range of issues, including safety, health and welfare matters, can be included in union consultations with employers.



Near-miss reports

A near miss is where there was potential for an accident but in that particular instance there was no injury or financial loss.

Some employers encourage quarry workers to complete and submit near-miss reports.

The near-miss report can be submitted anonymously or a person's name can be included if they would like some feedback.

Procedures vary, but the near-miss report is usually read and, where necessary, acted upon by the quarry manager, safety committee and/or safety officer/manager.



Highlighting and acting upon near misses could prevent an accident, serious injury or financial loss in the future.

Workplace Contact Unit

Workers who feel that their employer has not dealt satisfactorily with their representation can make a complaint to the HSA's Workplace Contact Unit. The unit will seek to resolve the issue. If that is not possible, the complaint may be referred to an inspector.

The Workplace Contact Unit can be reached at **1890 289 389** or **wcu@hsa.ie**. It provides information and advice relating to safety, health and welfare matters.

Workers can ask for their identity to be withheld if they think that divulging their name(s) could be detrimental to their employment.

Please be aware that at a small workplace it may be difficult for the Workplace Contact Unit or an inspector to follow up on a complaint without arousing the suspicion of the employer as to who may have raised the issue.

What can I do to protect my safety and health at work?

You have a duty to protect your safety and health at work and that of any person affected by your actions. To comply with this duty you must use safety equipment correctly, wear appropriate high-visibility clothing, report hazards and always adopt safe working practices and behaviours.

PPE and safety equipment

Workers have a duty to use correctly any personal protective equipment (PPE) or safety equipment provided by their employer. Examples include hearing protection, respiratory protection, hard hats, steel toe-capped boots, seat belts in vehicles, gloves, safety harnesses and lanyards.

Workers who have a problem with the PPE or safety equipment issued must raise it with their employer to see why it is required and what alternatives may be available.

Workers handling chemicals must ensure that they are using the correct PPE as listed on the safety data sheet or on the packaging.

This equipment protects your safety and health. Always use it properly.

High-visibility clothing

The use of high-visibility clothing greatly improves the visibility of workers in a quarry and reduces their exposure to the risk of an accident.

The high-visibility clothing provided by employers include vests, t-shirts, trousers, jackets, hats and coveralls.

The operator sets the policy for the use of high-visibility clothing at the quarry, and requirements will range from waistcoats to full-body high-visibility suits.



What can I do to protect my safety and health at work?

The type of clothing worn in a quarry will also be determined by issues such as lighting in the area and conditions such as fog and snow. Quarries that operate in the hours of darkness have an increased hazard.

It is advisable for employers to provide maintenance workers and anyone who works in an area that has many moving vehicles with a full high-visibility body suit. Such suits help machinery operators to see where workers are and take the necessary precautions to protect them.

Wearing appropriate high-visibility clothing will help protect your safety and health.

Designated pedestrian routes

Quarry operators should provide designated pedestrian routes or prohibit pedestrian access to areas where pedestrian routes cannot be provided.

When there is no pedestrian route, access should be by vehicle only, or, where access is essential, carried out within the quarry's operating procedures.

Always use the pedestrian route provided and do not enter prohibited areas.



Vehicle checks

Workers who operate a vehicle should carry out a daily check of that vehicle before use. This check should include testing:

- tyres,
- reversing and visibility aids,
- lights,
- access steps,
- oil and water levels, and
- brakes.

What can I do to protect my safety and health at work?

The date of the inspection and any defects should be recorded and a plan put in place to rectify any defects.

Do not use any vehicle that has a serious defect that makes it unsafe for you to operate or puts anyone else at risk.



Maintenance operations

Anyone planning to carry out maintenance work must isolate the plant and equipment before starting the work.

It may also be necessary to isolate other plant that could create a hazard if it started up. For example, if carrying out work on a crusher or screener, the feed conveyor should also be isolated.

Isolation should be physical and preferably should involve locking the electrical supply so that it cannot be re-energised unintentionally.

If carrying out maintenance on pressure systems or where there is stored energy such as hydraulic systems or work on crushers or block-making machines, the stored energy should be released first or the equipment locked so that the stored energy cannot be released during the maintenance work.

You must always isolate equipment before you start a maintenance operation.



What can I do to protect my safety and health at work?

Removing and replacing guards

Any guard or safety device removed (during maintenance work, for example) must be replaced before the equipment can be used again.

If you see a missing or faulty guard on a piece of equipment you should replace it or, if you are unable to do so, report it immediately to your supervisor.

You should never work near unguarded machinery. If you are replacing a missing guard, the machinery must first be isolated so that it cannot restart whilst the guard is being fitted.



Mobile phones and radios

Mobile phones and radios, even hands-free devices, should not be used by anyone operating plant and machinery as they can cause a distraction that can have devastating results.

The operator and/or contractor should have a policy on the use of mobile phones and radios whilst operating plant and equipment.

If you need to take or make a call or answer a radio, then the plant or machinery you are using must first be brought to a safe position.



What can I do to protect my safety and health at work?

Defects and safety issues

Workers have a legal duty to report any defects or safety, health and hygiene issues at the quarry unless they are able to remedy the defect/issue safely. They should report the defect/issue to their supervisor.

Workers who complete a vehicle inspection should include any issue/defect they found in their inspection report.

Significant defects (failure of the rear-view camera, faulty brakes, etc.) may need to be addressed immediately before work on a task can continue.

Other issues may not need to be attended to immediately and can wait until a break or the end of the working day (changing a light bulb on a vehicle, etc.).

Always report defects and safety issues to reduce the risk of accidents for everyone at the quarry.



Improper behaviour

Improper behaviour includes harassing, intimidating, sexually or racially abusing or bullying other persons in the workplace. Workers should never engage in improper behaviour.

If you observe instances of improper behaviour you should report them to your employer.

Alcohol and drugs

Workers should never turn up for work under the influence of drink or drugs (this could include certain medications). Operating plant and machinery under the influence of drink or drugs places the worker and his or her co-workers at increased risk of injury.

Never work under the influence of drink or drugs as you are putting yourself and others at risk.



What will others do to protect my safety and health at work?

The quarry operator and other contractors working at the quarry have a duty to safeguard your safety, health and welfare.

Safety statement

A safety statement is a document that outlines how the operator manages safety and health at the quarry and it is required under the Safety, Health and Welfare at Work Act 2005.

The operator must prepare a safety statement and must ensure that any contractor working at the quarry also has a safety statement.

The employer (operator or contractor) must bring all relevant parts of the safety statement to the attention of their workers and to anyone else who may be affected by their activities.

Risk assessments

The operator and any contractors working at the quarry must prepare specific risk assessments for the activities they are carrying out.

These risk assessments identify the hazards and risks associated with each activity and the control measures to be put in place to ensure that the risk to persons is minimised.

The workers involved in carrying out the activity should also be involved

in the preparation of the risk assessment so that they know how to manage and control the risks at the quarry.

Before starting certain tasks, workers may be required to complete a pre-task checklist to make sure they are aware of the risks and that adequate control measures are in place.

The operator and contractors must co-operate with each other to control risks, especially where their activities interact.

Competent workers

The operator must establish a management structure that includes the appointment of an adequate number of competent persons to enable the quarry to be operated and managed safely and in accordance with the safety statement.

This management structure must include the appointment of a quarry manager and requires that adequate supervision is provided.

Mobile plant such as loaders, dumpers and excavators must be operated only by competent persons who hold a valid QSCS (Quality Skills Certification Scheme) card.

What will others do to protect my safety and health at work? (Cont'd)

The explosives supervisor and the shotfirer must be competent and hold the relevant QSCS card.

To maintain competence, training may need to be repeated and quarry operators should encourage upskilling of workers.

The operator is also required to prepare an inspection and maintenance scheme that requires competent persons to undertake and record any actions required under the scheme.

Emergency procedures

Quarry operators and contractors should ensure that their employees are aware of the actions to take in the event of an emergency and are given the training they need.



Basic information on the emergency procedures should be provided during induction training and specific additional training may also be necessary in firefighting, first aid and evacuation.

Traffic management

The operator has a duty to design the quarry so that vehicles can run safely.

This duty requires the operator to prepare vehicle and transport rules and to develop a traffic management plan to ensure that:

- pedestrians and vehicles are segregated wherever possible,
- roads are well maintained, without excessive gradients and tight turns,
- roads are of sufficient width to allow vehicles to pass safely, and
- edge protection is in place, where necessary.

The operator should put measures in place to eliminate reversing of vehicles, or reduce it to the lowest possible level, through the provision of adequately signed traffic routes and one-way systems.



What will others do to protect my safety and health at work? (Cont'd)



Where there is a risk of a vehicle travelling over an open edge or into water or similar material, the operator must ensure that adequate edge protection is in place. The height of the edge protection should be at least 1.5 metres or half the height of the largest vehicle wheel in use at the quarry. The purpose of the edge protection is to safely stop the largest, fully loaded vehicle crossing it when travelling at the maximum foreseeable speed and should be constructed with this in mind.

All workers should wear high-visibility clothing and should remain in their vehicles at all times other than when they are parked in designated areas.

Parking facilities for the private vehicles of workers and visitors should be in an area away from any quarry traffic movements.



Machinery

The operator and contractors operating their own equipment or using equipment provided by the operator for their use, shall ensure that all conveyors, crushers, sizers and screeners, including mobile equipment, are adequately guarded at all times whilst in use.

What will others do to protect my safety and health at work? (Cont'd)

The guarding should prevent access to all moving parts that are nip points or present a risk of entanglement for workers. This should include all drive belts and chain drives, inspection hatches, delivery and return drums, tension units and bottom belt rollers that can be accessed.



Horizontal conveyors or inclined conveyors with a walkway must have a stop pull-wire with one or more lock-out units along its length. Emergency stops and isolation points should be located at each end of the conveyor.

Mobile equipment must have emergency-stop devices located at suitable points that can be easily accessed by workers if they need to stop the machinery in an emergency situation.

Walkways along inclined conveyors must be maintained in a good condition and be fitted with necessary handrails and means to prevent objects falling from the walkway to the ground below.



If guarding must be removed for maintenance reasons, then the equipment must be securely isolated and the guarding replaced before the isolation is removed.



What will others do to protect my safety and health at work? (Cont'd)

Confined spaces

A confined space at a quarry could be a tunnel, a hopper, a silo or a storage bin; in asphalt plants, it could be the stone dryer or the skip. It is any enclosed place where persons may have to enter.

The operator and/or contractor must carry out hazard identification and a risk assessment and prepare a safe system of work if entry into a confined space is necessary and there is potential for someone entering to be affected by any of the following:

- flammable or explosive atmospheres,
- harmful gas, fumes or vapour,
- free-flowing solids or an increasing level of liquid,
- excess or deficiency of oxygen, and
- excessively high temperatures.



Work should not be carried out in a confined space if it can be avoided.

The operator and/or contractor must provide appropriate information, training and instruction and ensure that emergency arrangements are prepared identifying how a person who gets into difficulty in the confined space can be rescued without endangering others.

See Code of Practice for Working in Confined Spaces at www.hsa.ie

Excavations

Quarries occasionally require the digging of excavations for pipes and electrical services. This work can be hazardous and fatalities and serious injuries frequently occur.

Accidents can be the result of the failure of the sides of an excavation, the collapse of the excavation due to loading of materials close to it, or carrying out excavations close to an existing structure or wall. There is also potential for striking live electrical cables or gas pipelines, the excavator/digger falling into the excavation or persons being struck by the excavator during its operation.

What will others do to protect my safety and health at work? (Cont'd)

A safe system of work must be in place for anyone working in an excavation. Such workers must be provided with appropriate information, training and instruction and the work must be adequately supervised with the necessary control measures in place.



Electrically powered tools

When using electrically powered tools and extension cables at a quarry the supply must be reduced to 110 volts to lessen the possible impact of a person coming into contact with a live supply. Often these tools are centre tapped so that the maximum potential exposure is 55 volts.

220/240 volt tools and extension cables should never be used due to the harsh, dusty and wet conditions often found at quarries.

Before “plugging in or” using any electrical tool or extension cable, workers should carry out a physical inspection to check that there are no visible signs of damage or faults to the tool or to the cabling.



What will others do to protect my safety and health at work? (Cont'd)

Chemicals

The definition of a 'chemical' is extremely broad and includes any substance or mixture. So everything from washing-up liquid to used engine oil is a chemical.

Quarries use hydraulic and engine oils, greases, lubricants, diesel and a variety of other chemicals; concrete plants use retarders and other additives.

It is important that workers wear any necessary PPE when handling chemicals and follow good hygiene standards so that chemicals are not ingested or able to enter the body through the skin.



What will others do to protect my safety and health at work? (Cont'd)

Design and excavation of a quarry face

The operator has a duty to design excavations, tips and lagoons so that they can be operated safely without becoming a significant hazard.

The quarry face should be designed so that it is stable and without risk of collapse.

The maximum safe height of excavated faces is influenced by the geology and physical properties of the material being excavated; the size, height and type of machinery; and the working methods used.

A face should not be in excess of 20 metres high and local conditions or the equipment available may necessitate a much lower face.

For sand, gravel and other unconsolidated material, the maximum recommended face height is 7.5 metres, but this is again dependent upon local conditions and the equipment in use at the face.

Any excavator used at the face must:

- have a cab with falling object protection (FOP's),
- be on a suitable rock pad with an adequate rock trap, and
- have adequate reach to be able to dress the face and remove any dangerous loose hanging rock.



What will others do to protect my safety and health at work? (Cont'd)

Work at the top of a quarry face

If workers are required to work at the top of a quarry face and there is a risk of them falling over the quarry face, then the operator must ensure that measures are in place to eliminate the risk of falling. Such measures include:

- provision of fall prevention and protection equipment – collective measures (barrier using straps and poles, etc.) or a physical barrier are preferable to individual measures (lanyards, harnesses, etc.),
- specific procedures as to how and when the fall protection is erected and taken down, and
- training in the use of fall prevention equipment.

Harnesses should be used by persons erecting or dismantling the edge

protection and not as fall protection during drilling and blasting.

If tipping is being carried out at the top of a quarry face, tipper trucks should not reverse to the face and tip, they should tip at a place of safety and the material should be pushed over using a bulldozer or a loading shovel.

Stockpiles

The operator must ensure that suitable procedures are in place for the safe operation of tips and stockpiles.

The access ramp for tipping must be suitably constructed and compacted and there should be adequate edge protection to prevent vehicles from driving off the ramp.

Reversing up the ramp and reverse tipping should be avoided.



What will others do to protect my safety and health at work? (Cont'd)

Simultaneous tipping and extraction to and from a stockpile should never be carried out as it can lead to instability.

Ponds and lagoons

The operator must have procedures in place to prevent workers from being placed at risk of drowning at or near ponds and lagoons.

Adequate precautions must be in place to prevent persons accidentally falling into water.

Maintenance work at pumps or other equipment must be planned and, where there is a risk of a person falling into the water, flotation devices must be worn.

Rescue equipment must be in place and workers must be trained in emergency response procedures.

Lone workers should not carry out tasks at or near water where there is a risk of drowning.



Maintenance work

A large proportion of serious and fatal accidents occur during maintenance operations. Maintenance work should be carried out only by competent persons.

The equipment being maintained should be made safe, preferably through isolation, before maintenance work is carried out. Any stored energy should, where possible, be released and the equipment should be locked in place to prevent unintentional movement.

Unless it is essential, and then only where a risk assessment has been carried out, maintenance should not be carried out on moving equipment.

Any guards removed during maintenance work must be replaced before the isolation is removed.

Safe access must be provided before carrying out any maintenance work at height.

Working from the bucket of a loading shovel or from the forks of a forklift is not acceptable.

Maintenance work on fragile roofs must be carried out using a safe system of work.

What will others do to protect my safety and health at work? (Cont'd)

Tyre changing and maintenance should be carried out only by a competent person, and the inflation of tyres must be done from a position of safety.



Workers who are involved or who have to pass these manufacturing operations should be advised of the risks and should be provided with the necessary PPE and high-visibility clothing.

The traffic and pedestrian routes should be adequately signposted and plant such as conveyors, cement mixers, block layers and strapping machines should be adequately guarded and have the necessary interlocks and safety devices.

Maintenance activities should be carried out only when the plant is isolated.

Manufacturing operations

A lot of quarries have manufacturing operations such as ready-mix or block production, which can increase the volume of traffic at the quarry.

Workers who are not involved should be segregated from manufacturing activities by the use of dedicated pedestrian and/or traffic routes.



What will others do to protect my safety and health at work? (Cont'd)

Dignity at work

Employers are required to develop a policy to ensure that all employees are treated with dignity and respect and they should be committed to ensuring that employees are provided with a safe working environment that is free from all forms of bullying, sexual harassment and harassment.



Welfare facilities

Workers at a quarry are entitled to adequate welfare facilities to take their breaks or to shelter from poor weather conditions. These include adequate seating, a supply of drinking water and facilities to warm food and to make hot drinks.

The toilet and washing facilities should be maintained in a clean and hygienic condition. There should also be somewhere to dry wet clothes and store clothes not used for work.

These facilities should be available to both direct employees of the quarry

and to contractors and their staff working at the quarry.



Health surveillance

Quarry operators and contractors are required to provide appropriate health surveillance for their workers, having regard to the risks they face. Surveillance may include:

- lung function tests if workers are exposed to dust injurious to their health, and
- audiometry if workers are exposed to noise that could permanently damage their hearing.

For new employees, pre-employment health tests will establish a baseline to help the early identification of any later adverse effects on their health.

What if I am self-employed or a contractor's employee?

Quarry operators have a duty of care to contractors and their staff. Contractors and their staff have a duty to co-operate with the operator.

Operators

The quarry operator has overall responsibility for planning, co-ordinating and overseeing all work at the quarry, including the work of contractors.

The operator must ensure that contractors have correctly identified hazards and established control measures by carrying out risk assessments.

Contractors

Each contractor at a quarry remains responsible for complying with the relevant safety and health legislation.

A contractor must comply with all quarry rules and safe operating procedures and co-operate with the operator to ensure that the operator can carry out his or her statutory duties.

Co-operation

The HSA has developed the Client and Contractor Code of Conduct at Quarrying Locations (see www.hsa.ie).

The client (operator) should appoint a named single point of contact who will act at all times as the location liaison. Where possible, the contractor should reciprocate by also naming a contact person on site.

Both the operator and the contractor should actively encourage involvement in site briefings, toolbox talks and safety committee meetings. A focus on partnership and co-operative working that is relevant to the nature of the work undertaken will help to achieve active engagement in safety and health matters at the quarry at all levels.

Site-specific safety induction training should be available to the employees of a contractor.

All incident, injury and near-miss investigations should be carried out using a partnership approach between the operator and the contractor to ensure that the immediate, underlying and root causes are identified and addressed.

What regulations apply to quarries and who enforces them?

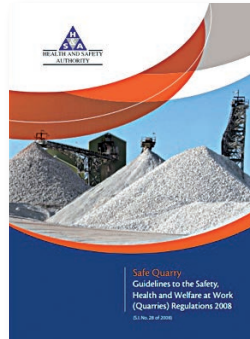
Safety, health and welfare legislation

A quarry is a workplace so all general safety, health and welfare legislation applies. The primary pieces of legislation are:

- Safety, Health and Welfare at Work Act 2005
- Safety, Health and Welfare at Work (General Application) Regulations 2007
- Safety, Health and Welfare at Work (Quarries) Regulations 2008

The Quarries Regulations cover specific quarry issues such as drilling and blasting, traffic management, inspection schemes and quarry face, tip and lagoon safety. A guidance document entitled Safe Quarry gives detailed information to help quarry operators comply with the regulations (http://www.hsa.ie/eng/Publications_and_Forms/Publications/Mines_and_Quarries/Safe_Quarry_-_Guidelines_to_the_Safety,_Health_and_Welfare_at_Work_Quarry_Regulations_2008.html).

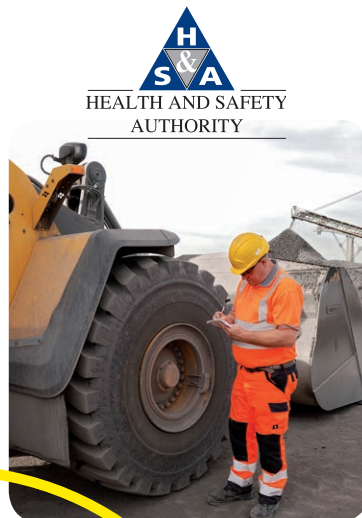
Specific legislation in relation to areas such as asbestos, confined space entry, construction work, biological agents, chemicals and carcinogens may also apply to quarries.



Health and Safety Authority

The HSA is responsible for ensuring that there is general compliance at workplaces, including quarries, with safety and health regulations.

HSA inspectors carry out a significant number of quarry inspections and investigations of quarries annually.



How do I use the SLAM technique to do an on-the-job risk assessment?

To help create a healthy and safe quarry, use the SLAM technique to determine the risks involved in any given task. There are four stages to SLAM:

Stop – Look – Assess – Manage

Stop

Stop the task and think. Consider each step of the task. Ask yourself:

- Is this a new task or has the task changed in any way?
- When was the last time I did this task?
- Do I feel comfortable doing this task?
- Do I need training? (You should not perform the task until you have been trained.)

Look

Look at the work area before, during and after completion of the task. Ask yourself:

- What are the potential hazards (unsecured ladders, untidiness, etc.)?
- Are there different hazards for each step of the task?
- What should I do to address these hazards?

Assess

Assess each step of the task. Ask yourself:

- Do I have the correct knowledge and skills to perform the task safely?
- Do I need more training?
- Am I equipped with the appropriate tools to perform the task safely?
- What else do I need to perform the task safely?
- Do I need help? (You should always ask for help when you need it.)

Manage

You and your employer should take appropriate action to eliminate or minimise any hazards on site by ensuring that the proper equipment is used and is well maintained and by reviewing completed tasks. Ask yourself:

- What went well? What did not go well?
- Did anything unexpected happen?
- How can I be better prepared and plan for this in the future?

Before you start work each day take a moment to think:

A moment's thought can save a lifetime of pain.

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