

**National Certificate in Building, Construction, and Allied Trades Skills (BCATS)**

**Demonstrate knowledge of and  
apply safe working practices in a  
BCATS work place**

Unit Standard – 24354

Level 2, Credit 4

**Name:** \_\_\_\_\_





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## **What you need to do**

By the end of this module, you should be able to:

- demonstrate knowledge of health and safety legislation;
- demonstrate knowledge of health and safety procedures; and
- apply safe working practices.

### **How you will be assessed**

To achieve this unit standard, you need to complete a construction project or projects where you can demonstrate knowledge of health and safety legislation and procedures, and use safe working practices. Your teacher/tutor will tell you which project(s) to construct.

You need to show your teacher/tutor that you can:

- explain why we have health and safety in the work place legislation and how it affects employees and employers;
- describe how electrical, chemical, fire, fumes, gas, compressed air, noise, material, falling, and lifting hazards are identified, and how to control four potential hazards;
- recognise hazard warning signs;
- identify personal hazards, including not enough training, clothing, hair, footwear, jewellery, lifting, handling, heights, and occupational overuse syndrome;
- explain and demonstrate emergency procedures for a fire, earthquake, accident and chemical spill;
- follow safe work practices including training to do a task and to use different machinery, and using PPE, protective clothing and protective barriers;
- follow safe work practices when using machinery, including using fences, guards, safety devices and personal protective equipment;
- keep walkways, floors and workbenches clean and free of unused tools and rubbish; and
- check and use equipment correctly.

Your teacher/tutor will also give you a worksheet that you need to complete, which your teacher/tutor will mark.



## Glossary of Terms

Term	Meaning
Accident	An accident is an event that: causes any person to be harmed, or in different circumstances might have caused any person to be harmed
All practicable steps	All steps to achieve the result that are reasonably practicable to take in the circumstances, having due regard to the: <ul style="list-style-type: none"> <li>• nature and severity of harm;</li> <li>• current state of knowledge about that harm;</li> <li>• current state of knowledge about the means available to achieve the result;</li> <li>• availability and cost of each of those means.</li> </ul>
Compliance	Performance requirement with the hierarchy of controls in the Health and Safety in Employment Act and Health and Safety in Employment Regulations
Emergency	A sudden unforeseen situation requiring immediate action
Employee	A person employed by any other person to do any work (other than residential work) for hire or reward
Employer	A person who employs any other person to do any work for hire or reward
H & S	Health and Safety
Harm	Illness, injury or both
Hazard	A hazard is something that could harm you or someone else.
Hazard identification	The process of recognising that a hazard exists and defining its characteristics
Hierarchy of hazard control	This is a process required by the Health and Safety in Employment Act for controlling significant hazards. It is closely linked to risk assessment
HSE	This is the Health and Safety in Employment Act. It governs the health and safety of people at work
Incident	An unplanned event resulting in or having a potential for injury, ill health, damage or other loss
Injury	The outcome of an unintentional event or accident
Injury prevention	A process or strategy for identifying risk to a person
Organisation	Any business engaging, controlling or employing people
OSH	Occupational Safety and Health (Department of Labour, Workplace Safety)
Plant	Includes: <ul style="list-style-type: none"> <li>• appliances, equipment, fitting furniture, implements, machines, machinery, tools and vehicles; and</li> <li>• part of any plant, the controls of any plant, and anything connected to any plant.</li> </ul>
Policy	A statement of intent/commitment usually by an employer reflecting their commitment to managing a healthy and safe working environment
Risk	The combination of the frequency or probability of occurrence and consequence of a specified hazardous event
Safe	In relation to a person, safe means not exposed to any hazards. In every other case, safe means free from hazards
Serious harm	Death or other harm deemed to be serious by the Act

Term	Meaning
Significant hazard	<p>A hazard that is an actual or potential cause or source of serious harm;</p> <ul style="list-style-type: none"> <li>• harm (being harm that is more than trivial) the severity of whose effects on any person depends (entirely or among other things) on the extent or frequency of the person’s exposure to the hazard; or</li> <li>• harm that does not usually occur, or usually is not easily detectable until a significant time after exposure to the hazard.</li> </ul>
Site-specific safety plan	<p>A site-specific document that demonstrates an organisation’s means of compliance with the Health and Safety in Employment Act and includes the following:</p> <ul style="list-style-type: none"> <li>• assignment of responsibilities for on-site implementation;</li> <li>• hazard identification methods;</li> <li>• accident investigation and reporting;</li> <li>• site emergency procedures;</li> <li>• site communication strategy;</li> <li>• site audit procedures; and</li> <li>• strategy for the coordination of on-site trade activities.</li> </ul>
Strategy	<p>A defined plan of action that when put in place will achieve the desired outcome.</p>
Substance	<p>Anything that is an organic material – whether living or not</p>
Systematic	<p>Methodical approach to a task</p>



## Introduction

Understanding safety when it comes to working on and around construction sites is critical. Every year, accidents happen that could have been avoided if some basic rules and common sense had been applied to the situation.

To ensure the safety of both those working on construction sites and others who may be affected by their work, there are several Acts of Parliament, supporting sets of regulations and various codes that need to be understood. These include:

- the Health and Safety in Employment Act (HSE) and Health and Safety in Employment Regulations; and
- the Building Act and Building Regulations.

Acts are laws made by Parliament. Regulations are laws made by the Governor-General, Ministers of the Crown and certain other bodies, under powers conferred by an Act of Parliament.

The main purpose of regulations made under the HSE Act is to:

- Set minimum standards for the management of particular hazards where alternative control measures are not always effective; and
- also to deal with administrative matters provided for in the Act (such as appointment of inspectors).

Where a regulation exists, its requirements are mandatory ie compulsory.

The Health and Safety in Employment Regulations 1995 apply to all workplaces and cover:

- Facilities required for the safety and health of employees;
- Precautions to be taken with some particular hazards;
- Notification of hazardous construction and forestry work;
- Certificates of competence for some kinds of work;
- Young people in places of work; and
- Agricultural workers' accommodation.



# The Health and Safety in Employment Act

The object of the Health and Safety in Employment Act 1992 (HSE Act), Regulations 1995 and the 2002 Amendments is to promote the prevention of harm to people at work and others in, or in the vicinity of, places of work.

To achieve this objective, it imposes duties on all parties associated with work and the work place.

These parties include:

- company principals;
- employers;
- employee/student; and
- people who control places of work.

Under the HSE Act and specifically the subsequent 2002 Amendment, all student/trainees who are involved in work experience activities, including Gateway or Star programmes and after school work, are required to be covered by the same health and safety conditions and requirements as a permanent or part time employee.

While an employer has legal responsibilities to ensure that these requirements are provided, students/trainees also have a legal responsibility to ensure that they work safely at all times.

## Identifying hazards

A primary requirement of the HSE Act is for all employers (including schools and training providers) to identify and manage hazards. Hazards continually change because of what people do or do not do, and because the nature of the work may change.

### What it means for learners

Under the legislation, learners or students are considered “persons who are lawfully in a place of work” and are affected by the work of others, such as teachers and tutors (who are employees).

Your school or training provider is required to ensure that no person is harmed by any hazard that may arise out of the work or in the place of work. Under the legislation, your school or training provider is an employer or person with control of the place of work.

To be able to meet this obligation, it is important that you are provided with information about:

- general safety rules and procedures for the workshop and worksites;
- personal protective equipment or clothing that must be used or worn;
- hazards you may come across or which you might create;
- how to identify a hazard and what to do to manage that hazard;
- what to do if there is an accident;

- the location and use of safety equipment; and
- emergency procedures.

You are responsible for:

- following these rules and procedures;
- identifying and reporting potential hazards;
- protecting yourself and others from potential hazards; and
- taking steps to eliminate, isolate, or minimise these hazards.

### **What it means for employers**

Employers have the principal responsibility to ensure the health and safety of employees and students.

As an employer, your school or training provider must ensure the health and safety of tutors/teachers (employees), and learners/students who are affected by their work.

In particular, employers are required to take all practicable steps to:

- provide and maintain a safe working environment;
- ensure that machinery and equipment are safe for employees/students;
- ensure that working arrangements are not hazardous to employees/students; and
- provide procedures to deal with emergencies that may arise while employees/students are at work.

Employers also have a duty to manage hazards and must have an effective method in place to identify and regularly review hazards in the place of work. (The term "hazards" includes existing hazards, new hazards and potential hazards.) They must also determine whether the identified hazards are significant hazards, which will require further action.

If an accident or harm occurs, the employer has a responsibility to investigate the accident and determine if it was caused by a significant hazard.

Employers must take all practicable steps to ensure that employees/students do not harm any other person while at work, including members of the public or visitors to the place of work.

## Managing hazards

Under the HSE Act, where a significant hazard is identified, the employer must take the following steps:

1. Where possible, the hazard must be **eliminated**.
2. If elimination is not possible, the hazard must be **isolated**.
3. If isolation is not possible, the employer must **minimise** the likelihood that someone will be harmed by the hazard.

Employers and training organisations must make sure that:

- people know what to do to ensure they are not harmed by a hazard;
- protective equipment is provided, used and easy to get at;
- people know who to report any hazard to;
- people's exposure to any hazard is monitored; and
- people's health is monitored, with their consent.

Your own behaviour is also very important in eliminating and minimising hazards. Your actions can lead to you or some other person being hurt, so you need to have a responsible and safe attitude.

This involves:

- carrying out instructions correctly;
- asking for advice when in doubt;
- wearing personal protective equipment and clothing;
- using the correct tools and equipment;
- using only tools, machinery and equipment that you have been trained to use;
- not starting machinery unless you have been instructed to do so and all guards are in place;
- keeping the workshop/project site clean and tidy;
- reporting any unsafe conditions to your teacher/tutor;
- reporting any injury to your teacher/tutor;
- not distracting others or fooling around; and
- knowing about and understanding your school or training provider's health and safety rules and procedures.

**Providing information**

One of the employer's responsibilities is to provide you with easily understood information on:

- the identified hazards that you will encounter;
- the identified hazards that you will or may create;
- the steps to take with those hazards to prevent harm;
- what to do in an emergency;
- where all safety clothing, devices, equipment and materials are kept; and
- situations that require the use of safety clothing, devices, equipment and materials.

**Training and supervision**

Employers have a responsibility to ensure that students/trainees are adequately trained or supervised before using or handling:

- plant and equipment; and
- toxic or dangerous materials.

All employers must ensure that students/trainees wear the appropriate protective clothing and equipment for the job.

**Applying this knowledge**

Even before you enter the work place, you should start thinking about safety.

- At your interview, look for indications that the employer is committed to providing a safe working environment (e.g. warning signs in hazardous areas, employees/students wearing protective equipment, safety posters).
- Ensure that you receive a safety induction before commencing work.
- Ensure that you follow all safety precautions.
- Always wear your personal protective equipment properly.
- During the induction don't be afraid to ask experienced employees about safety precautions and site hazards.
- If you are working with chemicals or hazardous materials ensure that you identify any potential threats to your health. To find out more information about toxic substances:
  - read the product safety data information;
  - ask your supervisor or employer; or
  - ask the Department of Labour (OSH) for advice.
- Notify your supervisor if you experience any symptoms, such as headache, dizziness, irritation in your throat or eyes or skin rashes that might indicate that you are being inappropriately exposed to a chemical.

The ability to recognise potential hazards in the workplace is a combination of common sense, observation, learning and experience.

**What you should do**

If you feel your workplace is unhealthy or unsafe there is a process that should be followed:

1. Tell your supervisor of the problem.
2. If your supervisor does not deal with the problem or you feel the problem has not been fixed, contact the supervisor's senior or the company's health and safety representative.
3. If the matter is still unresolved, you could discuss it with your union representative.
4. If the unsafe situation still exists, contact your local OSH Branch for further advice.

**Ultimately, all employees have the right to refuse to do work that is unsafe.**

To continually demonstrate the high awareness of safety, you must have the:

- **knowledge** about the hazards you encounter;
- **practical skills** to avoid them; and the
- **motivation** to apply your safety skills and knowledge.

**Reporting accidents**

In the case of an accident resulting in serious injury, an employer must notify the Department of Labour, Occupational Safety and Health Service (OSH), as soon as possible after the event.

In addition, no person is permitted to interfere with or remove any wreckage from the scene, unless it is necessary to prevent further harm. (ref.HSE Act 1992 reprint 2003)

**What is the Occupational Safety and Health Service?**

The Occupational Safety and Health Service (OSH) is a service of the Department of Labour. It is responsible for improving health and safety in the workplace. It does this by providing information, advice, education and through enforcement. OSH has trained and qualified health and safety inspectors who can advise on health and safety issues in the workplace.



# Activity 1

1. What legislation covers the safety of people in the workplace?

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2. What is the definition of a hazard?

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3. List two (2) methods used to identify hazards in the workplace.

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4. Once a hazard has been identified, what are the employer’s responsibilities?

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5. List three (3) health and safety responsibilities of any employee/student.

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6. Before you enter a workplace your employer is obliged to provide you with specific safety information. List four (4) types of information that would ensure they meet this requirement.

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7. Where do you get information on the toxicity of the materials that you are working with?

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**8.** Hazard identification and management

For each of the following scenarios, you are to:

- a. identify the potential hazards
- b. describe any potential consequences or harm
- c. describe the appropriate course of action for managing the hazards.

Put your answers on the Hazard Identification Table on the **following page**.

**Example:** This one has been done for you.

The nearest power point to your workbench is on the opposite side of the workshop. Whenever you wish to use a power tool you have to run an extension lead across the floor. People walking past your bench either step over the lead or on it. Identify the hazards and how they would be managed.

- i) You are preparing to use a portable power planer to skim the side off a door. You have left your safety glasses in the workshop. It will take you half an hour to go back and get them. The job will only take 10 minutes to complete. Describe the hazard, describe the potential harm and describe the actions required to manage the hazard.
- ii) During your first week on the job you have been told to use the circular saw bench to rip some lengths of timber into strips. You have never used a circular saw before or been given any instruction about the correct operating procedures for one. Describe the hazard, describe the potential harm and describe the actions required to manage the hazard.
- iii) The body of the electric drill is cracked. Some of the wires are exposed but none of them appear to be damaged. Describe the hazard, describe the potential harm and describe the actions required to manage the hazard.
- iv) You are using the spindle moulder to shape some short lengths of timber. The guards are getting in the way. One of your workmates suggests removing them until you complete this job. Describe the hazard, describe the potential harm and describe the actions required to manage the hazard.
- v) You are in the process of delivering a finished set of chairs to a customer. As you unload the truck you notice that one of the chair legs is made of cross-grained timber. Describe the hazard, describe the potential harm and describe the actions required to manage the hazard.
- vi) You have just spilt some oil on the workshop floor; it is the end of the day and you plan to clean it up tomorrow. Describe the hazard, describe the potential harm and describe the actions required to manage the hazard.

## Hazard Identification Table

## Hazard controls

A. Describe the Hazard	B. Potential harm	C. Action proposed (to Eliminate, Isolate or Minimise).
<b>Example</b> Tripping over leads	Sprains, bruising, electrocution	Either: Fit a new power point closer to your bench . or Run extension leads overhead.
1		
2		
3		
4		
5		
6		



# Apply Safe Working Practices

## On site emergency procedures

Every site needs to have an emergency plan. The plan should highlight what to do in the event of an emergency happening. While it is reasonably easy to put in place appropriate steps to follow should an incident, such as a fire or earthquake, happen it is not so easy to address other types of emergencies unless some thought has been provided to the likelihood of them occurring on that particular site. This is why such plans need to be site-specific.

The emergency procedures set out in the site-specific safety plan should clearly show what to do and where to go should any emergency situation occur.

There are six main types of emergencies where construction work is concerned. They are:

- fire, the principal causes of which are:
  - makeshift or temporary wiring;
  - overloading of electrical wiring or equipment;
  - lack of maintenance of electrical equipment and appliances;
  - welding or gas cutting near flammable materials;
  - spillage of flammable materials near sources of ignition;
  - improper storage or use of flammable materials;
  - carelessly dropped cigarettes and matches; and
  - poor housekeeping;
- people trapped in confined spaces or on the side of a building or in an excavation;
- earthquakes;
- bomb threats;
- chemical spills; and
- explosions.

Whatever the cause, the impact of an emergency situation is often decided by the way people react to it. It is important for everyone's safety to know as much as possible about emergency precautions and prevention, along with the evacuation procedures for the workplace. Every person working on site should know:

- what to do in the case of an emergency;
- the location of fire extinguishers and how to operate them;
- the location of alarms or warning procedures;  
(dialling for Emergency Services within New Zealand – 111)
- where fire escapes are if appropriate; and



- the location of the designated emergency assembly point.

No matter what size a construction site is, it is necessary to have an emergency plan. This should address the needs of the site, including those who will be working there. It is important that everyone knows what to do and where to go should any unforeseen event happen while at work.

Talk to your employer and find out what to do should any of these emergency situations arise. It simply means being prepared. Remember, your life and that of others could depend on this knowledge.



# Fire

## Causes of fires

Fires need the three following ingredients to be present before any combustion can take place:

- oxygen;
- fuel; and
- heat.

If fire doesn't have oxygen, then it will burn out. If fire doesn't have heat, it wouldn't burn. If there was no fuel, there would be no fire.

Most of the serious fires in industry have been linked to unsafe acts or unsafe working conditions. A well-structured working environment will minimise the conditions for a fire.

The following are common causes of fire:

- build up of combustible materials, such as dust and fumes;
- poorly maintained or overloaded electrical wiring or equipment;
- improper storage or spillages of combustible materials;
- discarded cigarettes;
- heaters being left on; and
- sparks from welding or grinding operations.



Given the right conditions, fires can quickly get out of control. However, a quick reaction, which removes one or more of the elements on which the fire depends, can extinguish or contain it in its early stages.

In a fire, many products give off toxic fumes, which can present a greater hazard to workers than the fire itself.

For your own safety, you should know as much as possible about fire precautions, the location of and how to use fire equipment and the evacuation procedures for your place of work.

If you discover a fire your first concern must be to alert others. (Shout **Fire, Fire, Fire.**)

If you can access the fire fighting equipment and know how to use it, you may be able to extinguish the fire. Do not be a hero. Get out of the building and call the fire brigade.

## Fire Extinguishers

You may be able to stop or slow down a small fire, by using the correct type of fire extinguisher. The incorrect type of extinguisher may endanger the user or make the fire worse.

There are three classes of fire and you need a different type of extinguishers to fight each of them.

- |    |   |  |
|----|---|--|
| 1. | <b>Class A fires</b> – Wood fires.            | Use a <b>water</b> extinguisher or a <b>fire hose</b> .                        |
| 2. | <b>Class B fires</b> – Flammable liquid fire. | Use <b>dry powder</b> or <b>CO<sub>2</sub></b> extinguishers (carbon dioxide). |
| 3. | <b>Class C fires</b> – Electrical.            | Use <b>BCF dry powder</b> or <b>CO<sub>2</sub></b> extinguishers               |

Fire extinguishers will have clear labels as to their contents and use such as the labels shown below.



For fires in the workshop, or where there are wood and wood based products, use a **fire hose**.

For fires in the finishing area, where glues, cleaning agents and other chemicals are used, and for electrical fires use a **dry powder** or **CO<sub>2</sub>** extinguisher.

Aim the extinguisher at the **base of the fire** for maximum effectiveness.

**Never** use a water extinguisher on **solvent or paint fires**. Water will only spread the flames, and will not put the fire out.

**Never** use **water** on an electrical fire. Water conducts electricity, so you could be electrocuted.

All employees/students must know:

- what to do in the case of fire;
- where the extinguishers are and how to use them;
- the location of fire alarms and how to use them;
- where fire escapes are, if applicable; and
- emergency evacuation and assembly drill.



## Fire drill

Your employer is required to have an emergency evacuation procedures in place. They should also have someone qualified to administer first aid.

The evacuation procedure should include:

- Switch off all machines.
- Switch off power and gas mains, if it can be done safely.
- Leave quickly, but do not run.
- Close all doors when everyone is out.
- Move directly to the emergency evacuation assembly point, so all people on the site can be accounted for.





# Earthquake

Seek shelter until the earthquake ends. Assemble in the designated assembly point and count personnel to ensure that everyone is there.



## Chemical Spills

A chemical spill is the unplanned or uncontrolled release of any solid, semi-solid, liquid or gaseous hazardous chemical that can pose a potential safety or health risk to people or the environment.

In the event of a chemical spill, immediately inform your supervisor who will determine:

- if the area should be evacuated;
- if it is safe to clean it up;
- how to clean it up; or
- if an appropriately qualified person needs to be brought in to undertake the clean up.

### Fumes

A significant health problem can arise from welding plated metals; for example, cadmium and zinc plated materials are especially dangerous.

Nitrous fumes produced during all welding and cutting operations can build up quickly in poorly ventilated areas. Forced ventilation is essential in these situations. All employees/students who carry out welding or cutting where there is a risk of breathing dangerous fumes will need to wear appropriate respiratory protections.

# **Compressed Gases**

## **Main hazards**

Provision should be made to guard against the following potential hazards:

Fires caused by leakage of fuel (propane, acetylene) usually from damaged or badly joined sections of a hose.

Cylinder explosions caused by accidental leakage of oxygen from hoses or cutting torches.

Operators may release oxygen deliberately to try to clear fumes from the air, with the effect that it creates a situation where – with too much oxygen in the air – just one spark may set clothing alight. Oily or greasy clothes may also catch fire spontaneously.

Flashback caused by the operator trying to light the cutting torch when there is a mixture of oxygen and fuel gas in one hose.

Explosions or fires caused by flame cutting or welding drums, or tanks, that contain flammable materials, even in small amounts.

Breathing in dangerous fumes during cutting or welding operations.

Nearby flammable material catching fire.

## **Handling cylinders**

Cylinders should never be rolled along the ground or handled roughly. Wherever possible, a cylinder trolley should be used, with the cylinders attached by chains.

Cylinders should never be placed in a free-standing position. All practicable steps should be taken to temporarily secure cylinders to a secure point.

Cylinders should have time to settle after being brought to a standing position before being used.

## **Storage**

All hoses and cutting accessories should be removed at the completion of any work and stored away from cylinders.

Cylinders should be stored in an upright position away from other flammable substances and sources of ignition.

## **Equipment**

Only hoses that meet the appropriate standard should be used. They should be checked every day for signs of damage.

The hose length should be kept as short as possible. If lengths of hose have to be joined following the removal of damaged sections, only proper hose couplers and proprietary hose clamps should be used. Makeshift couplers made from pipe and twisted wire are unsuitable. Proper couplers should be used to connect the hose to the cylinder regulator.

# **Materials Management**

## **Stacking materials**

- Materials should be stacked so that they cannot slip or fall.
- Stacks should be arranged in clearly defined lines with walking space between them.
- The height of any stack is restricted by the capacity of the lower layers to withstand the weight on them.
- Objects such as drums or tins need to be secured if they are stacked on their sides.
- Store materials away in designated storage areas.
- Store long lengths of timber low in the rack and ensure that they do not project out into walk ways.
- Heavy loads should be kept low for safety and ease of handling.
- Ensure all racks are well organised, neat, tidy and secure.



# Working at Height

## Falling

Where there is a danger of a person falling from a height, consideration must be given to the most effective method of controlling the hazards associated with working at heights and ensure that control measures are in place before the work starts.

The danger of a fall is increased when working on or near the following areas:

- perimeter of buildings;
- opening in floors;
- access areas such as stairs, ladders, ramps and walkways;
- excavations; and
- on or around formwork and scaffolding.

Under the HSE Act, employers have a duty to manage hazards and are required by law to provide means to help prevent an employee/student from falling when working at heights of over 3 metres.

### Erecting physical barriers

Falls from heights kill and injure more people in construction than anything else.

Erecting physical barriers is the preferred control measure for preventing a person from falling from a height. (For example, edge protection systems, such as a guardrail erected around the edge of a building, or covers over openings in floors.) When physical barriers cannot be erected, personal fall protection equipment, such as a harness system, should be used. Roof ladders and scaffolding are also methods for ensuring safety from falls.



**Remember:** *It's not the fall that hurts, just the sudden stop at the bottom.*

## Ladder safety

The use of ladders to gain ready access to a high workplace is a necessity on a construction site.

Before you use a ladder, you should always inspect it for:

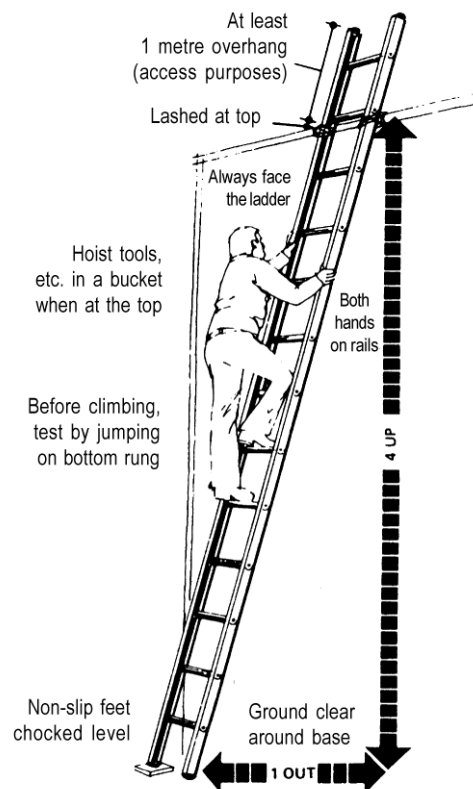
- defective rungs; you can test for faulty rungs by tapping them with a hammer – a dull sound indicates a defective rung;
- damaged, bent or cracked stiles;
- its rating – ensure that the ladder is rated “industrial”; and
- grease, oil, mud, wet paint, etc. your shoes should also be clean.

When carrying a ladder, you should always:

- be aware of overhead wires and live electrical circuits; and
- use two people to carry a long ladder.

When using a ladder, you should always:

- select the most suitable ladder for the task;
- use only stepladders with lockable spreader bars on both sides;
- set the ladder up on a firm even surface to the correct angle;
- secure the top and bottom of the ladder against sliding. Tie it off at the top and if necessary have someone hold the base of the ladder steady;
- ensure that the ladder is long enough. The ladder should project at least 1 metre above the landing;
- face the ladder and use both hands while climbing or descending;
- wear clean shoes with heels when climbing a ladder; and
- keep 3 body points in contact with the ladder at all times.



When working on a ladder, you should:

- be aware of overhead wires and live electrical circuits;
- never reach sideways from the ladder. Descend and move the ladder instead. Over extending from the side of the ladder shifts the user's centre of balance to a point where the ladder can slip;
- never stand on any of the top three rungs; and
- never stand unsupported on the top tread of a stepladder.

The Standards Association of New Zealand has issued standard specifications for the design and construction of ladders and stepladders. Only ladders meeting the appropriate standards should be used.



**Remember:** *Ladders are not designed as working platforms and should only be used for access or to carry out minor or routine work.*

## Safe Lifting

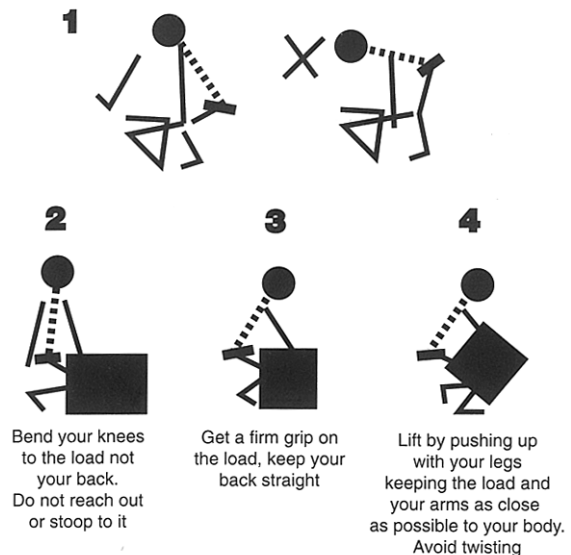
Most industry-related injuries occur when people are handling materials. These incidents often result in injuries, such as sprains, strains, hernias, hand and foot injuries, torn ligaments and muscles and spinal injuries.

Thousands of New Zealanders suffer the misery of chronic pain as the result of back injuries. Many of these injuries could have been avoided with more care and correct lifting practices.



### Safe lifting procedures

- Check that the load is within your lifting capability. Lifting a bulky or awkward load is more likely to cause back strain than lifting a heavier, compact item.
- Do not be afraid to ask for help. If the load is heavy use a trolley, forklift or gantry crane, if available.
- Inspect the load for sharp or damaged edges. Wear gloves to protect your hands from cuts or splinters when necessary.
- Bend your knees. Position your body as close to the load as possible with your feet at the same distance apart as your shoulder width.
- Stand up using your leg muscles to lift the weight. Look straight ahead and maintain a straight back. Refer to diagrams (above).



A back injury can impact on a person's quality of life and lifestyle for many years. When you are considering using a poor lifting technique, ask yourself "Is it worth the risk?"

### Safe carrying

- Carry the load as close to your body as possible.
- Keep your back straight.
- Ensure that your vision is not obscured and that your route is clear.
- The load should not interfere with normal walking. If it does, it is too heavy.
- When carrying sheets of material, such as plywood, position both people on the same side of sheet.





## Activity 2

1. You are required to unload 15 x 40kg bags of cement off the back of a truck. The storage area is 75 metres away across a drive littered with construction waste. Describe the safest and most efficient means to get the cement into the storage area.

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2. Describe the correct lifting techniques for a heavy load, such as a bag of cement.

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3. Describe the correct technique for carrying a sheet of plywood.

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4. Identify a hazard associated with storing heavy items on shelves.

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5. Identify the type of fire that you would use each of the following extinguishers for:

Provide an example of combustible material for each extinguisher.



Type of extinguisher:

For use on:

E.g. of combustible materials:



Type of extinguisher:

For use on:

E.g. of combustible materials:



Type of extinguisher:

For use on:

E.g. of combustible materials:

6. Describe the potential consequences of using a water type extinguisher on an electrical fire.

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7. What does the sign to the right represent and when would this area be used?

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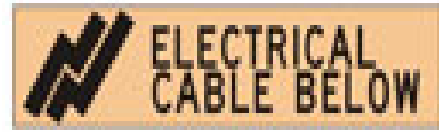
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## Electrical Safety

Overhead and underground power wires are an obvious hazard on building sites. Identify power supplies and electrical hazards before commencing work on the site. Be particularly vigilant when digging holes and carrying ladders.



Most power tools are double insulated; however, damaged or faulty power tools pose an obvious safety risk. Inspect your tools regularly. If they are damaged, report the fault immediately to your supervisor. Do not use damaged power tools.

When working outdoors or in damp or wet conditions there is an obvious risk of electrocution. Use circuit breaker safety devices, such as a **Residual Current Device (RCD)**, or isolating transformer, to prevent electrocution.

The RCD should be positioned at the source of power so that it protects the lead and the user. When the RCD detects the first signs of earth leakage it cuts the power off in less than 300 milliseconds.

RCDs have largely surpassed the use of isolating transformers, being smaller, lighter and easier to handle.

## **Compressed Air**

Compressed air is commonly used to drive tools and equipment in workshops and on construction sites. Pressures of 700kpa (100 psi) are quite common.

It is, however, very dangerous if used incorrectly and can cause severe or even fatal injuries.



Never direct compressed air at anyone:

- Eyes and ear-drums can be blown out or perforated.
- Air can penetrate the skin and may enter the blood stream through cuts or scratches.
- Compressed air penetrating any of the body's orifices can have fatal results.

Never use compressed air to blow down or clean machines or jobs:

- Particles and small objects can be blasted around the workshop at high velocity.

Never use compressed air to blow dust or filings off clothing, skin or machinery:

- The compressed air may penetrate the body, causing embolism, blindness or deafness.
- The compressed air may cause damage to nearby machinery.

### **Safety**

Regularly check air hoses and couplings for leaks, bulges in the hose wall linings or damage. Replace damaged hose and ensure that all couplings are secure.

 **Noise**

Because of the very nature of construction work, it is impossible to eliminate noise altogether. There are, however, steps that can be taken to minimise potential harmful effects caused by exposure to noise.

Wherever possible, noise should be controlled at the source.

Any process that causes excessive noise can be isolated or insulated by doing one or more of the following:

- increasing the distance between the source of the noise and the exposed person;
- placing barriers between the source of the noise and the exposed person;
- decreasing the time that a person is exposed to the noise source; and
- using ear protective devices.

In most cases, the use of ear protection is the only practicable step that can be taken on a construction site. However, the obligation to eliminate noise is ongoing. What this means is that when planning work or purchasing new equipment, consideration should be given to potential noise levels and what control measures there are available to ensure that noise is kept at the lowest level. When purchasing new equipment, priority should be given to equipment with low noise output.

Everyone who is exposed to noise while working should use a suitable grade of ear protection.

## **Chemicals**

Most industries use chemicals for various purposes. Some chemicals are dangerous, being highly flammable, corrosive or toxic. Remember, all chemicals are dangerous under certain conditions. Industry sectors, such as boat building, often have specialist facilities to cater for the amount of chemicals being processed on site.



When handling chemicals, no matter what quantities, you will be at risk from:

- inhalation of fumes;
- contact with skin; and
- accidental swallowing.

The health effects may result in asphyxiation, lung damage, burns, allergic reactions, irritation, toxicity or cancer.

When working with or near chemicals you should:

- recognise the hazard signs and the dangers they indicate;
- be aware of the dangers associated with the chemicals you are working with, and carefully read the manufacturers instructions on containers;
- know what to do in the case of a spillage;
- know where the emergency equipment is located and how to use it – fire fighting equipment, showers, eyewashes etc.;
- always wear protective clothing and equipment supplied;
- treat all containers with caution; and
- follow all hygiene rules for the job – most cases of dermatitis, poisoning and ulcers, and other chemical-induced ailments, could have been prevented by simple hygiene practices.



### **Treated timber**

Timber treatment consists of chemicals that may be harmful. Important measures to take when working with treated timbers are:

- Reduce contact with the timber by wearing gloves, goggles and a dust mask.
- Don't burn off-cuts or cook with them so dispose of waste in an approved landfill.
- Wash your hands before using the toilet, smoking, drinking or eating.
- Wash work clothes separately.
- Ventilate work spaces as much as you can.
- Do not work with solvent damp timber.

## Housekeeping

A tidy work place is a safe place to work. Good planning of construction processes that include housekeeping considerations is essential. This may include:

- maintenance of tools and equipment;
- putting tools and equipment away after use;
- maintaining clear walk ways;
- cleaning up the work site and removal of rubbish; and
- correct setting up and use of fences, barriers and warning signage.

### **Working in a public place**

The public must be protected from all hazards created when working on or near a public place. This can be achieved by:

- warning signs;
- illumination of hazard areas;
- fencing, barriers, cones;
- high-visibility clothing; and
- traffic controllers.



## **First Aid**

Minor injuries that are left untreated (such as cuts and abrasions) can often cause absences from work with the resulting loss of wages. In many cases it is not the initial injury that is the cause of the absence from work, but the infection or complication that follows. This could have been avoided if the proper first aid treatment was available.



When an injury or accident occurs, a person should always:

- seek immediate first aid treatment; and
- know where the first aid facilities are and who to contact. (First aid facilities should always be kept clean and properly equipped.)

If a fellow worker is seriously injured, arrange for a qualified first aider, doctor or ambulance to be called immediately. However, there may be occasions when immediate first aid treatment is needed to save a person's life. These could include cases of:

- severe bleeding;
- severe burns;
- electric shock; or
- poisoning.

People should learn how to deal with different types of emergencies. Obtaining a First Aid Certificate provides people with the skills needed to provide the first level of treatment. (First Aid Certificates need to be kept up-to-date. This means attending a refresher course every two years.)

### **First aid kits**

Under the Factories and Commercial Premises Act, all workplaces are required to provide a first aid kit.

1. First aid must be given to the injured person at the scene of the accident.
2. There must be a trained first aider in the workplace if it employs 50 staff or more.
3. There must be a register of treatment administered to accident victims.



**All workers should know basic first aid procedures relevant to their job.**

## **Untrained staff, the Health & Safety Act and OSH**

The HSE Act states that no person is allowed to work with any machine or equipment without first having been instructed in the safe use of that machine or equipment. Untrained staff operating machines and equipment can generate serious hazards for both the employer and the employee/student:

1. The staff member could be injured.
2. The machine could be damaged.
3. The job could be damaged.
4. Production could be disrupted.
5. The employer could be prosecuted by OSH for allowing untrained staff to operate machinery and equipment.

If you were injured while using a machine that you were not qualified to operate:

1. The employer could be investigated by OSH and fined or prosecuted for allowing unqualified staff to use hazardous machinery.
2. Your immediate workmates could also be fined or prosecuted if they witnessed your actions and did nothing about it.
3. As well as suffering the injury, you could also be fined or prosecuted if you were aware of the hazards and still carried on using the machinery.
4. You could suffer serious injury with long-term consequences.

### **You must follow all safety procedures and use the safety guards and equipment provided.**

Because each piece of equipment has its own safety procedures:

- Your supervisor is required to explain the safe working procedures for each machine before you start the job or use the equipment.
- Repeat the instructions and demonstrate the correct actions for your supervisor so the level of your understanding can be assessed.
- Ask questions to clarify any points that you don't understand.

You can refuse to work on any machine or equipment if you:

- have not been instructed in its safe use;
- do not feel confident about your ability to use it; or
- consider the machine is in a dangerous state:
  - missing safety guards;
  - unprotected wiring; or
  - defective switch.

When events result in serious harm you should:

1. make sure anyone injured or suspected of injury receives medical attention;
2. not interfere with the accident scene without permission of an OSH health and safety inspector, except to:
  - provide assistance to the victim; or
  - prevent further harm.

**Safety is everyone's responsibility – not just the responsibility of the organisation, company, teacher/tutor, employer, supervisor or trainee. Through the combined efforts of everyone, accidents can be prevented.**

Experience has shown that the best safety measure is a careful worker. Form safe working habits, wear the correct safety equipment and consider the safety and wellbeing of other workers.



## Activity 3

1. Your first job involves working on a roof. You feel uncomfortable at heights. What should you do?

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2. What is the recommended angle ratio for a ladder when it is set up?

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3. Why are electrical power lines an extreme hazard when you are carrying or using an aluminum ladder?

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4. What is the minimum distance the top of a ladder should extend above a working platform?

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5. Identify the possible consequences of directing compressed air at another person.

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6. Identify three (3) sources of information that you can use to identify the hazards and precautions associated with a specific product.

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- 7.** Identify three (3) potential hazards and ongoing consequences that could occur if you decide to use a machine without receiving instructions in its proper use.

Hazard 1:

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Consequence:

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Hazard 2:

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Consequence:

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Hazard 3:

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Consequence:

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- 8.** In the space provided, sketch the correct set up required to operate an electric power tool in an out door environment. Show the position of the:

- socket outlet
- power tool
- RCD
- cable

# Induction Training

Your induction training will be basic instruction in general occupational health and safety. It applies to all people who work on site, or in a workshop, in any capacity, other than emergency services personnel. This induction should be completed before the new employee/student starts work in any construction activity on site or in the workshop.

## **Personal protective equipment and clothing**

Personal protective equipment and clothing will vary greatly from job to job. It is often dependent upon the types of hazards that will be encountered while working on the site.

When the job requires exposure to heat, water, heights, asbestos, chemicals, solvents or other similar hazards then there will be a requirement for additional types of protective equipment and clothing.

Whatever the type of personal protective equipment and clothing required:

- keep it readily available;
- wear it whenever necessary; and
- keep it in good order and condition.

Today's standards for personal protective equipment and clothing are high. Responsible manufacturers usually meet specifications issued by the Standards Association of New Zealand. Where the Standards Association of New Zealand has approved the product, it will be identified with the standards certification mark.

Employers should provide (or ensure the employee/student has) the right personal protective equipment and clothing necessary for each job. An employee/student is obliged to wear the personal protective equipment and clothing that are provided, when necessary.

## **Ear plugs or muffs**

High noise levels for even a short period can damage hearing. (So can long exposure to moderate noise levels.)

There are different grades of hearing protection available. Each grade is suitable for a different noise level. Use the grade suitable for the work and wear it whenever the noise level requires it. Where construction work is concerned use Class 5 protection, as this is the highest level and will cover all the noise levels likely to be encountered while working on site.



### **Protective glasses, goggles or face masks**

Welding flash, flying sparks, wood dust and splinters, chemical splashes, dust, concrete chips and steel splinters, are some of the common causes of eye injury. The need to wear eye protection may not always seem as obvious. An example of this would be working near someone grinding steel. Logically, the person grinding the steel will need to wear eye protection, but any person working near the grinding should wear eye protection also. An eye injury needs to happen only once to blind a person for life!



### **Dust mask, respirator or self-contained breathing apparatus**

Fumes, vapours and dust need to be guarded against by using an appropriate respirator or dust mask. The type of protection chosen depends mainly upon the type of work being undertaken. For simple tasks of short duration, a dust mask would be suitable. However, for more toxic vapours or long exposures to high dust levels, an air supplied breathing apparatus would prove to be more suitable.



It is important to remember that damage may be done to the lungs and respiratory system through either long exposure to seemingly harmless dusts or by short exposure to a chemical. People should know the risk and wear the correct breathing protection required to overcome the risk at all times while working in that area. Working outside does not lower the risk. Wearing the right equipment for the purpose is very important. A simple dust mask will not provide protection against toxic fumes from solvents and glues – especially in spaces where these fumes may build up.

### **Safety footwear boots or shoes**

Suitable footwear for the work being undertaken is necessary on any construction site. In nearly all situations, this means safety boots or shoes (steel caps). Good robust footwear will provide a good footing and save possible slipping injuries. It will also protect feet from falling objects and objects penetrating through the sole of a shoe into the foot.



### **Hard hats**

When a helmet is required, it is important to ensure that it is a good comfortable fit. It may also be necessary to wear eye or hearing protection at the same time as wearing a helmet. This is often best fitted to the helmet for comfort and convenience.

Wearing head protection on these sites is often compulsory, especially where the site is designated as a “Hard Hat area”. The type of head protection worn must meet the requirements of the recognised New Zealand or international standard.



## Gloves and overalls

Wearing suitable gloves, overalls, day-glo jackets and other protective clothing can protect against exposure to dangerous materials and ensure that a person is “visible” on a construction site.



If wearing gloves or overalls, make sure they are a good fit, comfortable and appropriate for the environment and the task being performed.

Loose-fitting overalls and aprons can be extremely dangerous – particularly around machinery.

## Sun protection

Even short periods of unprotected exposure to the sun can cause burning and skin diseases.

Protect yourself by using sun block, a sun hat and long-sleeved shirts. In other words,

Slip, Slop, Slap!



# Activity 4

(A first aid manual may be used.)

**Scenario** – A pallet of timber tips off the forklift, crushing the leg of a workmate.

- 1. Explain the steps that should be taken to:

Get help:

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Administer first aid:

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Moving the load: (When can you interfere with the accident site?)

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- 2. In the space provided below, detail the information that you would give the operator when calling for an ambulance. This information will be found on the inside cover of the telephone directory. The operator will also assist you to provide the services with the information required.

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*The following page is a newspaper article describing an accident that happened in a timber mill. Read the report and answer the following questions. Also complete the following OSH Accident/Serious Harm and Accident Registration forms to the best of your ability, using the information given.*

*Using the attached OSH Accident Registration reports, study and complete the appropriate documentation relevant to the accident.*

## My mate saved my scalp when he put it on ice

Exclusive by **LEE UMBERS**

Scalping survivor Rainier Raharuhi will return to work this week after recovering from one of New Zealand's horrific industrial accidents.

With him will be league representative and former Mongrel Mobster Morgan Peke who helped save his workmate's scalp and maybe his life.

Peke, 30, fetched ice from a local pub to preserve the scalp for surgeons and swathed Raharuhi in bandaging to stem blood loss.

The one-time gang hardman also cuddled his colleague for nearly an hour, willing him to stay strong until the air ambulance arrived to rush him to Waikato Hospital.

Working on the grading table at National Park's Tongariro Sawmills, Raharuhi, 25, noticed a piece of wood blocking the conveyor belt.

He crawled under the table to free it but his long hair, tied in a bun, got caught on the transmission drive.

"Raharuhi says. "I put I could feel my scalp ripping off, "I put my hand up to my head and I could feel flesh and bone. I could feel the air on my brain". Panicked, he ran for help.

Peke, a table supervisor, heard colleagues' horrified yells and set off after Raharuhi.

"I could see Rainer running," he says. "I could see his skull and his face peeling off. "There was nothing holding the skin, his face and the back of his neck were curling up. I grabbed his face and pulled the skin back up".

Raharuhi had been scalped from his eyebrows to the nape of his neck and his right ear torn off.

Blood from the wounds had soaked his bush shirt, and Peke covered his colleague's head in tea towels to stem the flow.

As shock wore off Raharuhi went into convulsions and Peke cradled his

mate in his arms for almost an hour until paramedics arrived

"Rainier's body was jumping off the ground and his legs were spinning", Peke says. "I just grabbed him and held him into me. I said, "You'll be right bro".

When ambulance officers arrived, Peke jumped in his car and raced to the local pub to get ice to pack Raharuhi's scalp in – an action, which helped, save the tissue. Raharuhi has had three major operations to re-attach his scalp and ear. He will have more plastic surgery over the next several months, including a facelift and the re-building of an eyebrow and his hairline.

"The surgeons think once the scarring goes, in maybe up to two years, people might not even notice after my hair grows back" Raharuhi says.

Raharuhi is also grateful to his employer, Taranaki Sawmills (Tongariro Sawmills, parent company) which provided his partner and other family members with accommodation to be with him during his hospital stay and a caregiver for his young daughter.

The Occupational Safety and Health Service have praised Taranaki Sawmills, which also immediately provided trauma counsellors for mill staff, for its compassion.

Emergency stop controls have been improved at the mill since the accident and changes made to machinery to reduce the likelihood of timer jam-ups.

OSH, however, accepts the company did have acceptable safety mechanisms but Raharuhi contravened procedure in his enthusiasm not to hold up mill operation.

The accident was a reminder "no job's worth dying for", Lambie says.

Peke is eagerly awaiting his colleague's return. A former Manawatu league lock and Mongrel Mob member, Peke has seen his share of injuries but says Raharuhi's ordeal is "the worst thing I've been through".

Watching his mate's courage recovery had "made my heart a bit softer".



*SURVIVOR: Rainier Raharuhi says his accident has changed his life.*

*"I put my hand up to my head and I could feel flesh and bone. I could feel the air on my brain".*

### Surgery Saves Life

Re-attaching Raharuhi's scalp and right ear was an eight-hour intricate operation. It was performed under a microscope with 20-times magnification. Waikato Hospital consultants Michael Klaassen and Stuart McNicoll carried out the surgery. The pair sent eight hours taking vein grafts from the injured timber mill worker's arms and using them to re-attach his scalp and ear.

Their first priority was to re-attach blood vessels to get life saving blood pumping again. Because the scalp had been torn, the vessels in the major vein and artery were damaged.

The consultants grafted 15cm lengths of vein from both arms and used 7cm lengths to re-join the torn artery and vein.

They were sewn together by about 10 stitches, each finer than a hair. There were six joins.

Luckily the blood began pumping again almost immediately. The surgeons used 70 stitches to rejoin the scalp to the head.

### Questions

How did this accident occur?

How could it have been avoided?

What first aid was carried out?