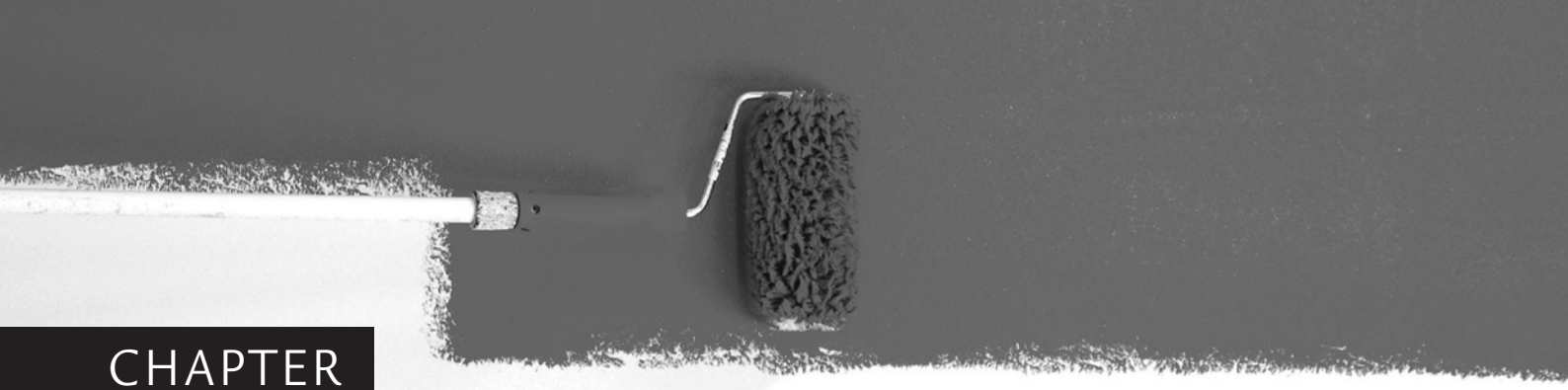

CHAPTER

1 OCCUPATIONAL HEALTH AND SAFETY

This chapter covers the requirements for safe work on a general construction site by outlining the requirements of the relevant state and territory OH&S Acts and Regulations, as they apply to all persons at work.

Areas addressed from the unit of competency include:

- following safe work practices;
- assessing risks; and
- following emergency procedures.

OH&S INTRODUCTION AND RESPONSIBILITIES

The term **occupational health and safety (OH&S)** **injuries**, making a healthier and safer working environment for all concerned. Building construction workers must be familiar with occupational health and safety requirements as these apply to the building and construction industry, and must understand the responsibilities of the employers and construction workers (employees).

Workplace statistics show that since 1997, approximately 300 Australians die every year from work-related **accidents**, with many more associated deaths from things such as silicosis, due to long-term exposure to dangerous substances such as silica in cement, tiles, stone and adhesives. In addition, almost 1000 persons a day suffer some type of work-related injury or illness. The importance of OH&S is evident in these statistics. Historically, the building industry is one of the most dangerous industries for workers.

The prevention of accidents in industry is the concern not only of experts: all workers must learn how to work without hurting themselves or endangering fellow workers. Every worker's own efforts in keeping the workplace safe, and reporting possible causes of injury, are most important.

Origin of modern occupational health and safety legislation

To understand fully any piece of **legislation** (law), it is important to appreciate the origin and reasons for the law first being introduced.

The industrial workplace in Australia is governed by either federal or state legislation, which varies from state to state and industry to industry. These laws and regulations provide a set of minimum standards of protection for the health and safety of workers.

On the federal level, the National Occupational Health and Safety Commission, known as Worksafe Australia, under the authority of the national *Occupational Health and Safety Act 1985*, assumes responsibility for developing national standards. Worksafe Australia seeks to build cooperation between the three groups involved—governments, business and unions—bringing them together to forge solutions and decide on policy. From this, the states develop their own legislation and policies.

South Australia was the first state to introduce legislation. In 1972 it introduced the *Industrial Safety and Welfare Act*. In 1986 it adopted the *Occupational Health, Safety and Welfare Act*, following the general form of Victorian state legislation.

In NSW the *Occupational Health and Safety Act* was proclaimed in 1983. It was enacted following the Williams Inquiry into health and safety practices in the workplace. The Inquiry was commissioned in 1979 as a result of pressure from trade unions and community groups over serious **hazards** faced by workers in NSW. The new **Act** amended and complements other legislation that previously covered workplace health and safety in NSW under seven separate Acts. In 1987 major changes were made to the Act.

Victoria introduced legislation in 1985 that became the model for the rest of the country. It had far-reaching social and industrial concepts incorporated into the legislation.

Other states and territories to introduce OH&S legislation are:

- Western Australia in 1984, amended in 2008;
- Tasmania in 1977, current Act is 1995;
- Queensland in 1989, current Act is 1995;
- Northern Territory in 1989, current Act is 2007;
- ACT in 1989, amended in 2009.

OH&S Acts

In Australia, states and territories have responsibility for making laws about occupational health and safety (OH&S) and for enforcing those laws. Each state and territory has a principal OH&S Act, setting out requirements for ensuring that workplaces are safe and healthy. These requirements spell out the duties of different groups of people who play a role in workplace health and safety (see Table 1.1).

OH&S Regulations and Codes of Practice

Some workplace hazards have the potential to cause so much injury or disease that specific Regulations or Codes of Practice are warranted. These Regulations and Codes, adopted under state and territory OH&S Acts, explain the duties of particular groups of people in controlling the risks associated with specific hazards. Note that:

- **Regulations** are legally enforceable.
- **Codes of Practice** provide advice on how to meet regulatory requirements. As such, Codes are not legally enforceable, but they can be used in courts as evidence that legal requirements have or have not been met.

Reasons for the introduction of occupational health and safety legislation

Cost of compensation

The total cost of work-related accidents and injuries on a national level was approximately $6 billion per year. Workers' compensation claims had increased by 10% since 1974.

Many workers not covered

Only about one-third of the workforce was covered by any occupational health and safety legislation.

Table 1.1 Relevant Australian state and territory OH&S Acts and Regulations, as of February 2009

State / Territory	Current OH&S Act	Current OH&S Regulation	OH&S Regulating Authority	Web link & contact numbers
WA	*Occupational Safety and Health Act 1984*	Occupational Safety and Health Regulations 1996	WorkSafe WA (a division of WA's Department of Commerce)	<www.slp.wa.gov.au/legislation/agency.nsf/docep_home.htmlx> Contact: 1300 307 877 or 08 9327 8777
Vic	*Occupational Health and Safety Act 2004*	Occupational Health and Safety Regulations 2007	WorkSafe Vic	<www.worksafe.vic.gov.au/wps/wcm/connect/WorkSafe/Home/Laws+and+Regulations> Contact: 1800 136 089 or 03 9641 1444
Qld	*Workplace Health and Safety Act 1995*	Workplace Health and Safety Regulation 2008	Department of Employment and Industrial Relations Qld	<www.deir.qld.gov.au/workplace> Contact: 1300 369 915 or 07 3225 2000
NSW	*Occupational Health and Safety Act 2000*	Occupational Health and Safety Regulation 2001	WorkCover NSW	<www.workcover.nsw.gov.au> Contact: 13 10 50 or 02 4321 5000
SA	*Occupational Health, Safety and Welfare (SafeWork SA) Amendment Act 2005*	Occupational Health, Safety and Welfare Regulations 1995	SafeWork SA	<www.safework.sa.gov.au> Contact: 1300 365 255 or 08 8303 0400
Tas	*Workplace Health and Safety Act 1995*	Workplace Health and Safety Regulations 1998	Workplace Standards Tas	<www.wst.tas.gov.au> Contact: 1300 366 322 or 03 6233 7657
ACT	*Occupational Health and Safety Act 1989*	Occupational Health and Safety (General) Regulation 2007	Department of Justice and Community Safety ACT	<www.ors.act.gov.au/workcover/WebPages/WorkSafe/ohs.htm> Contact: 02 6207 3000 or 02 6205 0200
NT	*Workplace Health and Safety Act 2007*	Workplace Health and Safety Regulations 2007	NT WorkSafe	<www.worksafe.nt.gov.au> Contact: 1800 019 115 or 08 8999 5010

National and overseas legal developments

On a national and international level there were efforts to update existing occupational health and safety legislation, to bring it into line with the 20th-century working environment. The states needed to keep abreast of these changes for social and economic reasons.

Too much occupational health and safety legislation

Although only one-third of the workforce was covered by any OH&S legislation, there were up to 26 different Acts in one state alone relating to occupational health and safety. Enforcement procedures for these Acts created a legal nightmare.

Self-regulation not working

Allowing organisations to regulate their own occupational health and safety programs was not working, at one stage, over 500 people were dying each year on a national basis due to work-related accidents, injuries and diseases.

Rights and responsibilities of employers and employees

In each state there are specific rights and responsibilities for employers and employees under the state's workplace OH&S legislation.

Occupational health and safety Acts aim to protect the health, safety and welfare of people at work. They lay down general requirements that must be met at places of work. All states have similar aims and regulations.

Requirements of state regulations

Each state has its own specific requirements, which may include any of the following.

The employers

Employers must provide for the health, safety and welfare of their employees at work. To do this, employers must:

- provide and maintain equipment and systems of work that are safe and without risks to health;
- make arrangements to ensure the safe use, handling, storage and transport of equipment and substances;
- provide the information, instruction, training and supervision necessary to ensure the health and safety of employees at work;
- maintain places of work under their control in a safe condition and provide and maintain safe entrances and exits;
- make available adequate information about research and relevant tests of substances used at the place of work.

Employers must not require employees to pay for anything done or provided to meet specific requirements made under the Acts or associated legislation. They must also ensure the health and safety of people visiting their places of work who are not employees.

The employees

Employees must take reasonable care of the health and safety of others. Employees must cooperate with employers in their efforts to comply with occupational health and safety requirements.

Employees must not:

- interfere with or misuse any item provided for the health, safety or welfare of persons at work;
- obstruct attempts to give aid or attempts to prevent a serious risk to the health and safety of a person at work;
- refuse a reasonable request to assist in giving aid or preventing a risk to health and safety.

Offences and penalties

Nationally, under the relevant OH&S Acts and Regulations pertaining to each state and territory, there are a number of offences, penalties and infringement systems in place. For example, certain states and territories adopted a system that applies a varying number of penalty units according to the severity of the offence, with each unit having a set monetary value. While the contravention value of offences varies, the underlying principles behind each state and territories infringement system are the same.

The harshness of fines issued is also influenced by whether an individual or a corporation is guilty of the offence and whether or not they are previous offenders. It should also be noted that, as well as the imposing of fines, courts may opt for a sentence of imprisonment; they also have the option to order offenders to undertake any or all of the following:

- to take steps to remedy or restore any matter caused by the offence;
- to pay WorkCover for the costs of the investigation;
- to publicise or notify other persons of the offence; or
- to carry out a project for the general improvement of health and safety.

It is recommended that readers become familiar with their relevant state or territory infringement systems by either contacting their respective OH&S Regulatory Authority, or accessing their website, as detailed in Table 1.1.

Site induction

Outlined within the relevant OH&S Acts and Regulations for Western Australia, Victoria, Queensland, New South Wales and South Australia are the duties and obligations of the principal contractor, employers and self-employed persons, in ensuring that all construction workers have undertaken mandatory **safety induction training**. Non-compliance could invoke a breach of the OH&S Act and subsequent fines may apply.

It is a requirement under the relevant OH&S Acts, enforced by each state's Regulating Authorities (i.e. WorkCover NSW, SafeWork SA, Department of Employment and Industrial Relations QLD, WorkSafe VIC and WorkSafe WA) that all workers carry out OH&S induction training to familiarise themselves with:

- the origins of the modern OH&S legislation;
- the rights and responsibilities of employers and employees in relation to the Act;
- identification of common workplace hazards;
- inspection of a workplace to assess risks;
- identification of quality control measures to control hazards;
- the purpose and use of work method statements;
- identification of essential **PPE (personal protective equipment)**;
- identification of barricades, hoardings and various signage to highlight site hazards and to protect workers.

Statement and proof of induction training

On successful completion and attendance of an OH&S induction training session a worker will be issued with a statement to outline the training and identify the training body, the training assessor and the date of the assessment.

In states where there is compulsory OH&S induction training, after the course each person is provided with a small plastic card.

Although there have been discussions for a national card, at the time of publication, each state of Australia differs. Examples of induction cards that you may come across are shown in Figures 1.1–1.4. They show the person's name, the date training was completed and the name of the group carrying out the training.

There has been a mutual agreement between the applicable state OH&S Regulating Authorities, to acknowledge acceptance for these OH&S Induction Cards from state to state. As long as the training meets existing standards for currency, as per the relevant state's requirements, and the construction worker can provide sufficient evidence that they hold either one of the general OH&S induction cards as shown in Figures 1.1–1.4, or similar, then they will be permitted to carry out work on a construction site without having to undertake the relevant general OH&S induction course pertinent to the state with which they are seeking employment.

The card should be carried on-site at all times and produced on demand for inspection.

Note: A statement of OH&S induction training may cease to be valid when a person has not carried out

Figure 1.1 Red card sample as issued in Victoria (prior to 1 July 2008)

Figure 1.2 Construction induction card sample as issued in Victoria (post 1 July 2008)

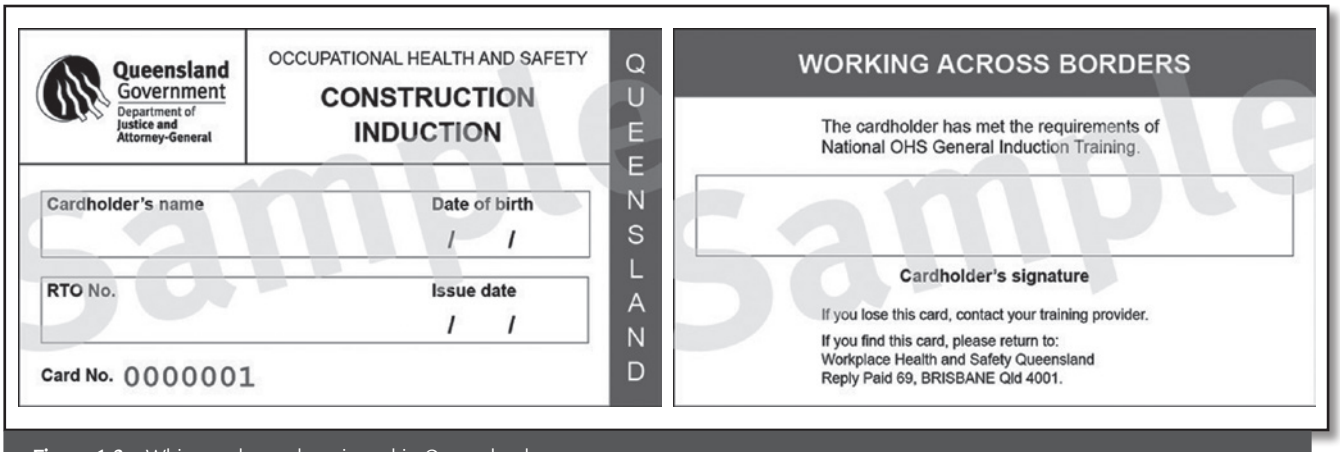

Figure 1.3 White card sample as issued in Queensland

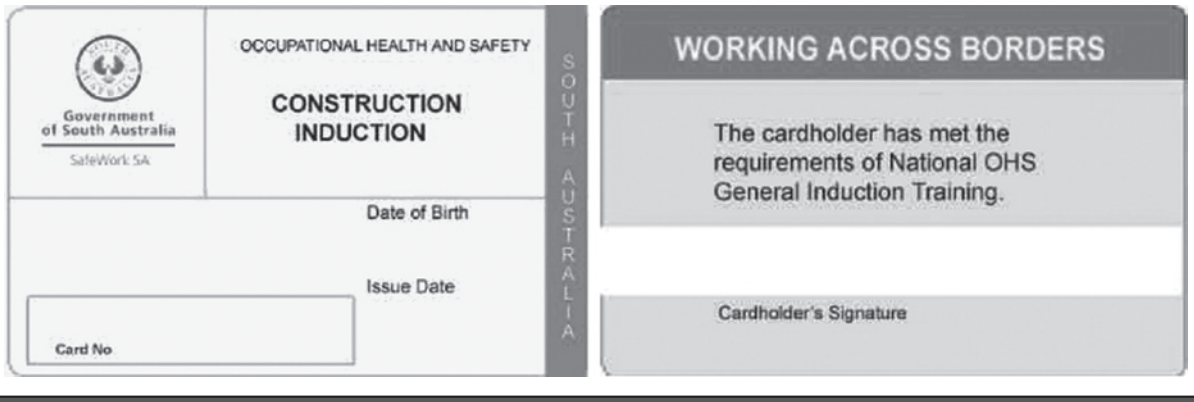

Figure 1.4 White card sample as issued in South Australia

construction work for a specific consecutive period of time. In some states this period may be as little as two years. This means that if you have not carried out construction work for the period stipulated by the applicable state's OH&S Regulating Authority, you must undergo safety induction training again. It is recommended that readers become familiar with their appropriate state's OH&S induction training programs, by either getting in contact with their respective OH&S Regulating Authority, or viewing their website, as detailed in Table 1.1.

What are Codes of Practice?

Codes of Practice are used in conjunction with the Act and Regulations, but they are not classified as law documents. However, while not mandatory, the Codes provide significant guidance and may be used as evidence in a court of law in cases relating to the *Occupational Health and Safety Act*.

The basic purpose of these Codes is to provide workers in the building industry with practical, commonsense, industry-acceptable ways of dealing with the OH&S Act and working safely.

They are put together and published by each state and territory OH&S Regulating Authority, and cover such areas as electrical safety, roof tiling, formworking, personal protective equipment (PPE), use of safety harnesses, construction and use of hoardings. A typical example is shown in Figure 1.5.

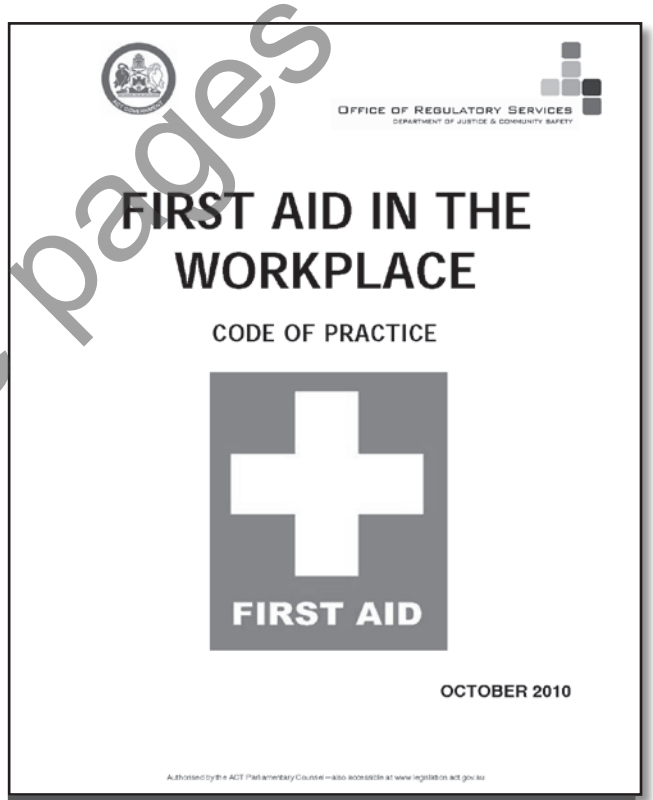

Figure 1.5 Typical Code of Practice

SAFE WORK PRACTICES

Manual handling

Manual handling is an activity requiring a person to use force to lift, lower, push, pull, carry, move or hold any type of object. As manual handling is the

most common hazard in the building industry, it is important for all workers to understand, and to be fully trained in, correct manual handling techniques.

In 1990, Worksafe Australia provided standards for manual handling with the introduction of the National Standard for Manual Handling and the National Code of Practice for Manual Handling.

The National Standard aims to prevent injury and reduce serious injuries resulting from manual handling tasks at work. It requires employers, in consultation with their workers, to identify, investigate and control the risks coming from manual handling activities in the workplace.

States may adopt the National Standard and Code for manual handling in their OH&S Regulations. This means that both the Standard and Code will operate as law in that state.

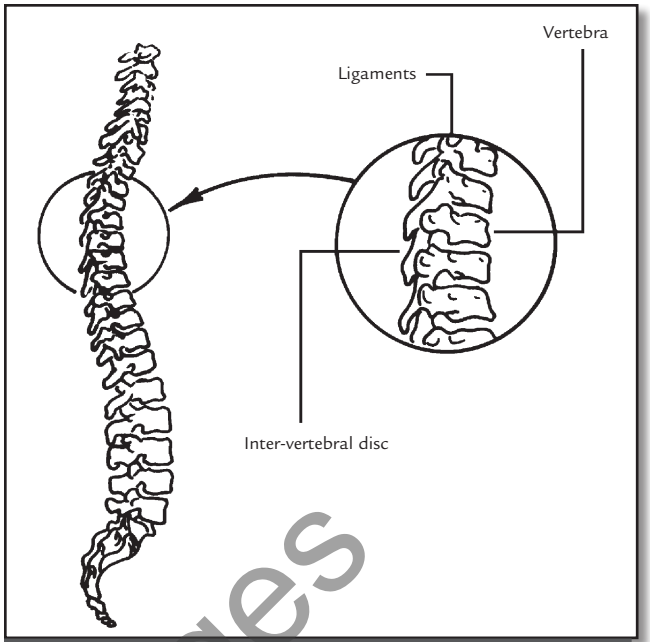

Figure 1.6 The human spine

Causes and effects of bodily injury

Back injuries

Most manual handling injuries are to a person's back. The spine consists of a series of vertebrae, separated by spongy discs or gristle. These discs are called inter-vertebral discs (Figure 1.6). They act as shock absorbers between the vertebrae. If the back is bent or twisted, the discs will be deformed by the vertebrae they support. Severe injuries occur when a load is so great that the disc ruptures (a slipped disc). However, painful injuries can occur without a rupture actually taking place.

Some experts believe that serious back injuries result from damage caused by years of bad practices, rather than from the single lift, twist or other movement that finally causes the injury to become apparent.

Fatigue

Fatigue caused by constant or heavy manual handling tasks can increase the chances of having an accident through loss of concentration.

Muscle injuries

Muscle injuries (musculoskeletal injuries) can be caused by strain to the legs, back, arms and tendons from overuse or by exceeding the capacity of the muscle to carry the load. These injuries may cause inflammation of the joints and surrounding nerves, spinal disc damage and hernias (rupturing of body tissue).

Heart and respiratory disease

Existing medical conditions can be aggravated by bad practices or excessive manual handling. The majority of these injuries are caused by:

- using incorrect techniques for lifting objects;
- being physically unfit;
- not using mechanical aids such as forklifts and conveyors to eliminate the need for manual handling;
- carrying out tasks without enough helpers;
- continuing on the same task for long periods of time;
- having work benches and tables at an unsuitable height for the particular work practice;
- prolonged exposer to dusts and noise.

To help prevent injuries resulting from the lifting and carrying of objects, one should:

- use suitable mechanical equipment whenever possible;
- redesign the task to minimise the risk of injury and eliminate the hazard;

- use the appropriate PPE;
- learn the correct methods of lifting and carrying.

Methods of manual handling

Lifting

Correct lifting methods require you to bend your knees, not your back. Never twist your body when lifting, carrying or moving a load. Protect your hands and feet with suitable PPE.

1. *Size up the load*. Consider the shape and size of the load, as well as the weight. If the load appears too heavy, get assistance.
2. *Position the feet*. Face the intended direction of travel. Place your feet comfortably apart, one foot forward of the other and as close as possible to the object to be lifted.
3. *Obtain a proper hold*. Get a safe, secure grip, diagonally opposite the object, with the whole length of the fingers and part of the palms of your hands.
4. *Maintain bent knees, straight back*. The knees should be bent before the hands are lowered to lift or set down a load. Keep the upper part of your body erect and as straight as possible.
5. *Keep the head erect, chin in*. Keep the head erect and chin in to help keep the back straight. Take a deep breath and begin to raise the load by straightening your legs. Complete the lift with your back held straight.
6. *Keep the arms in*. Keep your arms close to the body. Keep your elbows and knees slightly bent. Hold the load in close to your body. Maintain flexible control over the load with your arm and leg muscles.

Lowering

Setting down the load is the reverse of lifting. It is just as essential to keep the back straight and bend the knees while lowering the load as when lifting it.

Dual lifting

When more than one person is required to lift and carry a load, the correct lifting methods (as shown in Figure 1.7) must be practised, and coordinated team-lifting techniques should be applied.

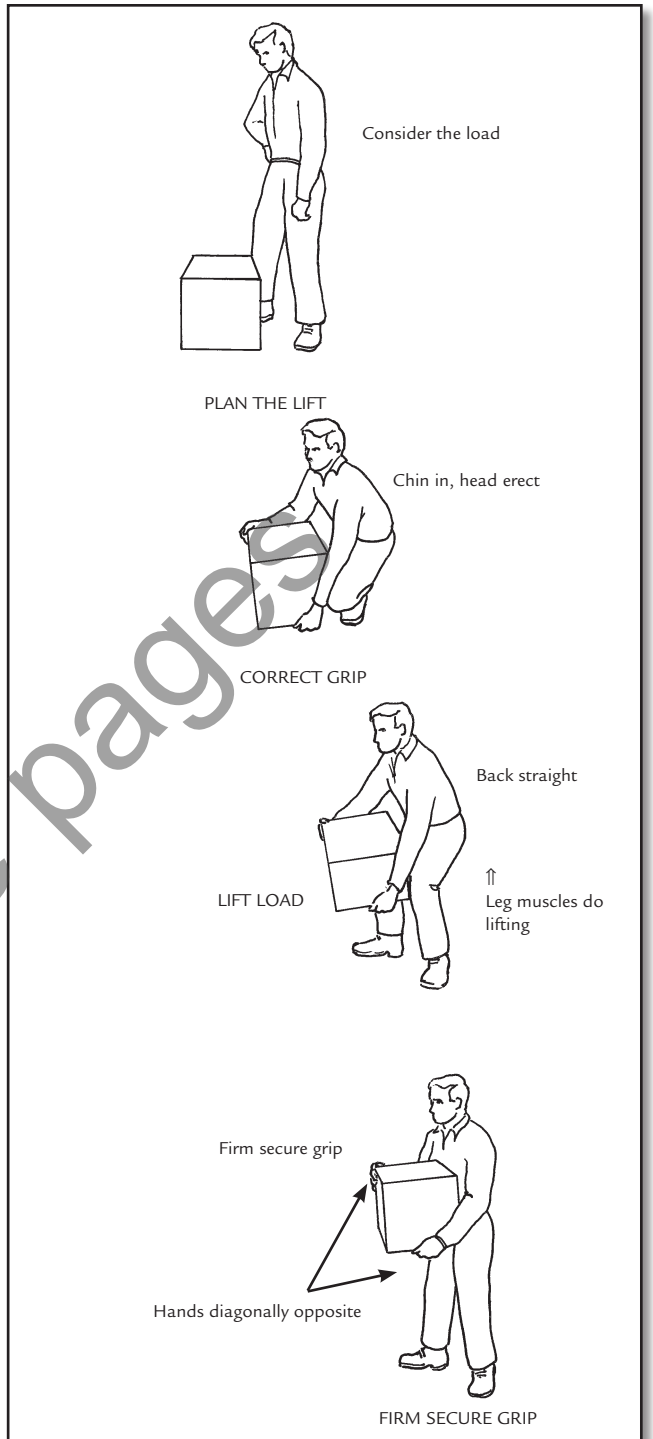

Figure 1.7 Lifting correctly

Coordinating team lifting

- One person only should give the orders and signals, and this person should be able to see what is happening.

- The movements of the team members should be performed simultaneously (all lift together).
- All persons involved in the lift should be able to see or hear the one giving the orders.
- To enable load sharing, lifting partners should be of similar height and build, or lifters should be graded by height along the load.
- Persons should be adequately trained in team lifting and preferably have been trained together.

Pushing and pulling

Tasks requiring the pushing or pulling of loads are more effectively carried out if the force is applied at or around waist level (Figure 1.8). When setting the load in motion, jerky actions should be avoided. Apply the force gradually to avoid overexertion and damage to the body.

Shovelling

The selection of the correct type of shovel for the job is important. In all cases it is essential that the length of the handle is suitable to reduce the strain and exertion on the body (Figure 1.9).

Long-handle shovelling

- Grasp the shovel with hands well apart.
- Place feet apart, one behind the other.

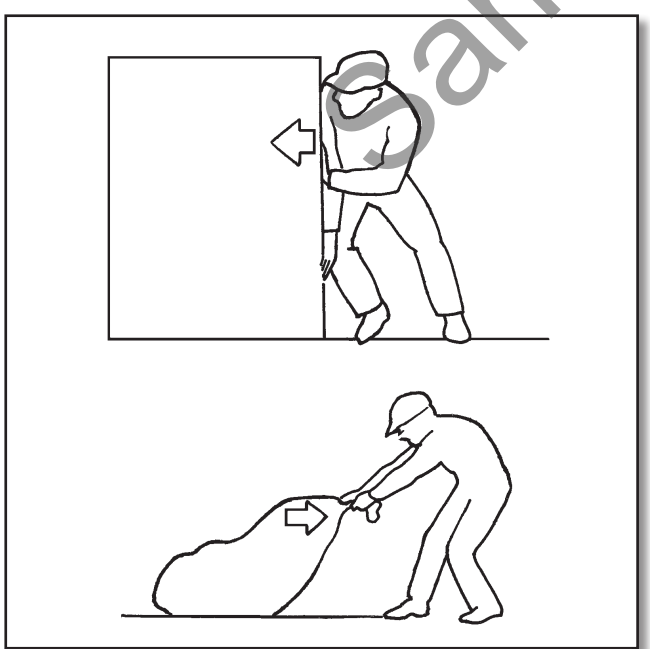

Figure 1.8 Apply push or pull force at around waist level

Figure 1.9 Correct posture when using a long-handled shovel

- Bend the forward knee.
- Use your body weight and pressure from the rear leg to drive the shovel forward and under the material.
- Lift the load by pressing down with the rear hand and straightening the front knee.
- Deliver the load by pivoting on the feet, using the front hand as a fulcrum.

Short-handle shovelling (see Figure 1.10)

- Grasp the shovel with hands well apart.
- Place the feet apart, one behind the other; bend both knees.
- Keep the back straight and inclined forward.
- Use your body weight in a forward and downward motion, with pressure from the rear leg; drive the shovel forward and under the material.
- Lift the load by straightening the front leg and back to a vertical position.

Mechanical aids

Mechanical aids reduce the amount of manual handling and the effort required for lifting and carrying tasks undertaken at the workplace. Some aids will give a mechanical advantage to the user to reduce the amount of effort required to carry out the task (e.g. the use of a manhole cover lifter, as in

Figure 1.10 Correct posture when using a short-handled shovel

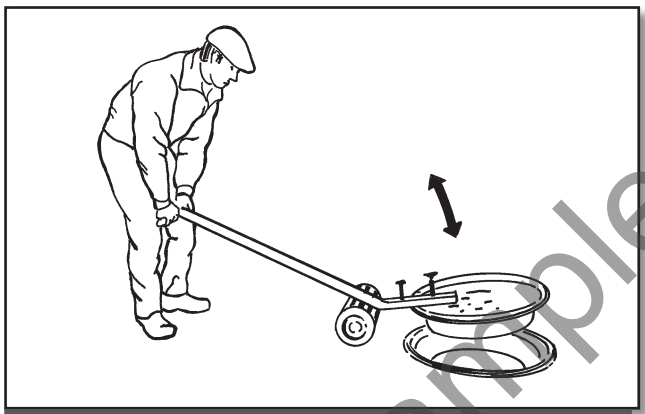

Figure 1.11 Manhole cover lifter

Figure 1.11). Some of the mechanical aids available are as follows:

- *Crowbars and levers*—give a mechanical advantage when lifting or moving an object, and can be used to set a heavy object in motion when using rollers or a crowbar to slide a heavy load forward.
- *Rollers*—placed under heavy loads to move them into position. The rollers may be simply pieces of water pipe or round rod, or may be more sophisticated, such as air bags, for use over rough terrain, or multi-wheeled skates to move very heavy loads (Figure 1.12). The larger the diameter of the roller, the easier the object is to move. The path of travel of the load must be cleared of all obstacles before commencing the move.

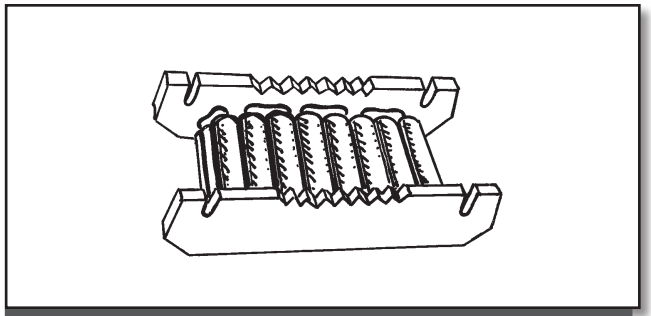

Figure 1.12 Multi-wheeled skate

- *Wheelbarrows*—the most common carrying aid used on building sites, used to cart concrete, bricks, tools etc. over all types of site conditions. They make it easy to negotiate tight situations due to the single wheel (Figure 1.13).

Figure 1.13 A typical wheelbarrow

- *Hand trucks, trolleys and wheelsets*—carrying aids that take most of the weight of the load (see Figures 1.14 and 1.15).
- *Cranes and hoists*—lift heavy loads without the use of manual handling. They may be hand- or power operated (Figure 1.16).
- *Jacks and lifting tackles*—lift heavy loads. Jacks may be hydraulic or mechanical. Lifting tackle may

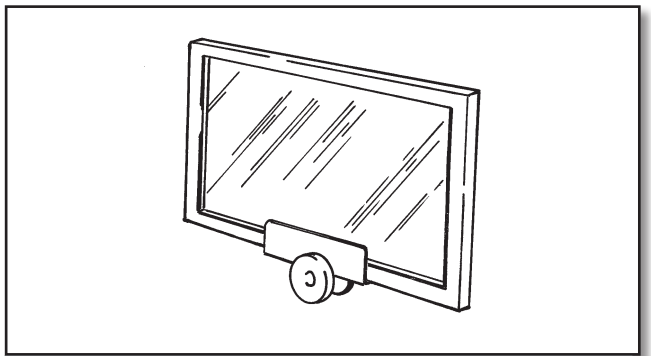

Figure 1.14 Wheelset

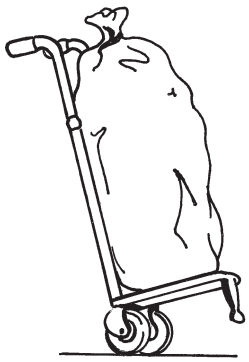

Figure 1.15 Hand trolley

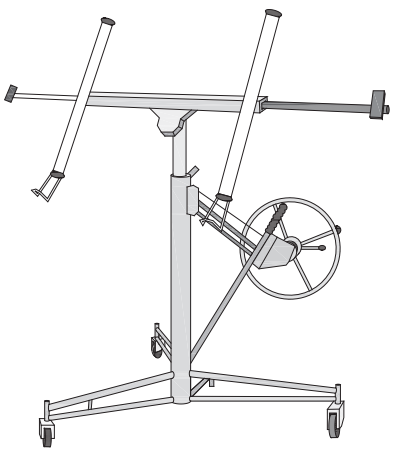

Figure 1.16 Sheet lifter

be pulley blocks with rope tackle, chain blocks (Figure 1.17) or wire rope tackle.

- *Forklift trucks and pallet trucks*—hand- or power driven. These move large quantities of materials fast and safely. Materials are normally stacked on pallets for ease of handling (Figure 1.18).

Figure 1.17 Chain block pulley system

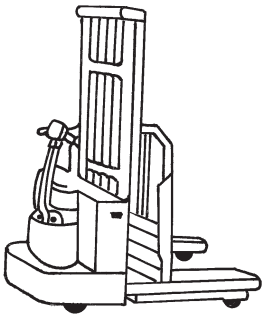

Figure 1.18 Forklift

- *Lifting grips*—used to allow safe lifting and carrying of awkward materials, e.g. suction grips for handling glass, carry grips for lifting and carrying sheet material (Figures 1.19 and 1.20).

Safe and responsible manual handling

- Compare the correct and incorrect ways of carrying a load in both arms. The worker must walk in an upright position and avoid bending the back either forward or backward.
- Do not carry a heavy load in one hand or under one arm, as this tends to bend the spine sideways. Distribute the load evenly so that the bone structure of the body can support the load without distortion. If this cannot be achieved on your own, get a helper or use carrying aids such as yokes or straps.
- Before attempting to move the load, check the route to be travelled. Make sure that there is

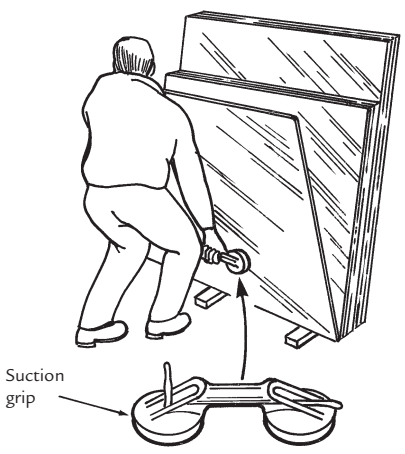

Figure 1.19 Suction grip for lifting

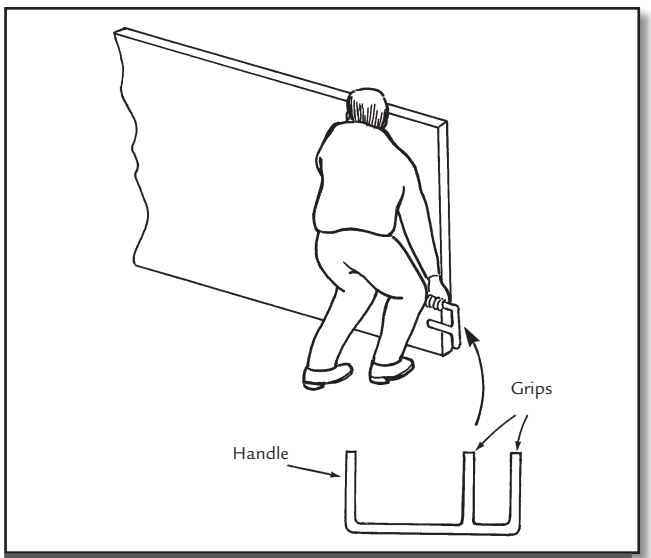

Figure 1.20 Carry grip

nothing in the way on which you could slip or trip; that it is clear of other obstructions; and that there is no overhead danger, or dangers from vehicular traffic.

- Check the area where the load is to be placed for space, and that packers (known as gluts or dunnages) are in place ready for stacking, before commencing to lift and carry the load.
- If supports are to be used to help carry the load, check that they are strong enough and are correctly placed to take the load.
- Dangerous substances or loads that are labelled corrosive or fragile should be handled with proper care.
- When it is necessary to change direction, move your feet and turn the whole body to avoid twisting your spine.
- Avoid manual handling in tight, constrictive positions.
- When carrying loads of separate units, divide the load evenly between both arms.

Clothing

Work clothes should be comfortable and allow freedom of movement. Clothing that is too tight will restrict movement and make safe manual handling more difficult.

Special note

Analysis of Industry Performance—Workplace Injuries may be accessed for workers' compensation statistics by contacting the respective OH&S Regulating Authority, or accessing its website, as detailed in Table 1.1 on p. 3.

HOUSEKEEPING AND WORKPLACE MAINTENANCE

Housekeeping of a building site involves the maintaining of the worksite in a *safe* and *clean* manner. This will improve:

- safety—by maintaining safety standards that will provide safe work areas;
- productivity—by allowing work to proceed faster, improving production times;
- access—by allowing safe access free of hazards to and from the work areas.

The tasks included under the term ***housekeeping*** involve:

- sorting and stacking of materials and equipment;
- removal of hazards;
- cleaning of work areas;
- disposal of rubbish (non-toxic waste);
- erecting/maintaining safety rails and barricades;
- maintaining safety equipment;
- removal of water hazards.

(**Non-toxic wastes** are all wastes created on a building site that do not produce either a toxic or poisonous health hazard or a toxic threat to the environment. They may, however, cause hazards to workers and the environment in other ways.)

Cleaning of work areas and removal of health hazards must be an ongoing operation on construction sites and other workplaces. It will help maintain a high standard of safety and a healthy environment in which to work. Before commencing the cleaning of a given work area, a planned approach must be formulated.

An inspection of the area should be carried out to determine the extent of the work.

The planned approach should consider:

- first, the removal of all hazards;
- the method of dust suppression to be used;
- designated material storage areas;
- cleaning and rubbish disposal methods to be used;
- use of drop sheets;
- safe access to and from the area;
- a systematic approach to the whole cleaning operation.

Housekeeping functions

- *Sort and stack* reusable and unused materials neatly and in a safe manner. A list should be placed on the stack giving any necessary details, such as the number of items and lengths of materials within the stack. This will avoid the unnecessary unpacking of the stacks by others to find required materials or items of equipment.
- *Remove hazards* that may cause people to trip, slip or be cut. Some of these hazards include broken tiles, bricks, paints, thinners, oil spills, water leakages, broken glass and sharp pieces of materials.
- *Transfer waste materials* to designated waste bins or rubbish stockpile areas. Special areas should be provided for hazardous materials found on the building site, e.g. asbestos, flammable liquids, oxy-acetylene bottles, cleaning materials and solvents. Hazardous materials must be removed or isolated to avoid dangers to workers and delays to work schedules. If left lying about the site they may cause deterioration to material finishes and plant and equipment by staining and corrosion.
- *Safety rails and barricades* should be erected around the edges of floor areas, openings in floors, stairways and trenches. Place and fix safety covers over holes where people could trip or fall.
- *Maintain safety equipment* in good condition so that it is ready to use. This should include cleaning and stocking first aid kits, making sure fire extinguishers are in place and charged, and seeing that safety signs are in place.
- *Electrical leads* should be kept clear of work and access areas by the provision of stands or hooks to keep them above the ground or floor.
- *Water hazards* should be drained, or barricaded off, to eliminate slippery conditions caused by spreading mud over walk areas.
- *PPE* should be worn at all times when carrying out housekeeping functions.
- *Correct lifting techniques* must be used.
- *Dangerous situations* can occur from lack of good housekeeping if:
  - combustible materials are left in areas where welding and grinding are being carried out;
  - spilt liquids are left on walk areas causing slippery conditions;
  - materials are stacked in an unsafe manner;
  - timbers and **formwork** materials are not de-nailed and stacked as they are dismantled;
  - unused materials are not stacked in a safe manner.

Hazard rectification

When inspecting the site prior to commencing cleaning operations, a hazardous or dangerous situation may be found. If the problem cannot be rectified immediately, the following steps should be taken:

1. Barricade off the area, warn others in the area of the danger and erect hazard warning signs.
2. Report the situation to your immediate supervisor or site safety officer.

Tools and equipment

Tools and equipment will be selected to suit the cleanup job to be carried out. In most cases the items required include the following:

- wheelbarrows—to provide a safe method of moving materials and rubbish;
- shovels and brooms—to sweep up and transfer rubbish to containers;
- cleaning equipment—to remove spills and stains;

- rubbish bins—for storage of rubbish until it can be removed from the site;
- rubbish chutes—to allow for a safe and easy method of transferring rubbish to ground level;
- vacuum cleaners—for the safe collection of hazardous dusts;
- pallets and pallet trucks—for the stacking of reusable and unused materials so that they can be moved with safety to the required areas;
- gluts—packers used to keep materials off the ground, as spacers between materials, or to allow space for forklift tines to get underneath. Also known as dunnage;
- ropes—to lift or lower materials or equipment from one level to another and for stabilising and tying loads;
- personal protective equipment—safety equipment for cleaning operations, which may include:
  - safety boots or footwear
  - hard hats
  - safety goggles
  - ear muffs/plugs
  - protective gloves
  - protective clothing
  - respirators
  - dust protective masks.

  Wearing these items of PPE equipment will minimise hazards to health and safety.

At the completion of the cleanup, all tools and equipment should be cleaned and returned to their correct storage places.

Dust suppression

Dusts in the workplace can cause:

- chemical hazards
- respiratory problems
- explosive hazards.

Therefore it is important to reduce to a minimum the amount of dust in the air. This is most important when cleanup operations are taking place, as large volumes of dust can be generated if care is not taken. Dust masks and eye protection may not keep all dust from entering the body tissue. Silica, asbestos, synthetic mineral fibre, cement and wood dusts are of particular concern on building sites.

The three most common methods of dust suppression are:

- *Wetting down.* This is a form of wet sweeping. The area to be swept is sprayed with a fine mist of water to dampen the dust particles before sweeping commences. This dampening of the dust stops it from floating in the air when disturbed. Care must be taken not to cause a hazardous area by the application of excessive amounts of water.
- *Damp sawdust.* This is another form of wet sweeping. Dampened sawdust is spread over the area and, when swept up, the fine dust particles cling to the sawdust, preventing them from floating in the air.
- *Vacuum cleaners.* Vacuuming is a very effective way of collecting hazardous dusts. It is particularly useful for those places that are difficult to reach with a broom. Ordinary household vacuum cleaners will not effectively trap the very fine dust particles, and are prone to clogging after a short time. You may need an industrial-quality vacuum cleaner with a HEPA (high effective particle air) filter. Where there is an explosion hazard, flame-proofed vacuum cleaners must be used. Some industrial-quality vacuum cleaners are of a 'wet and dry' type: these will pick up water, allowing you to wet down the area before commencing vacuuming.

Personal cleaning procedures

Cleaning operations bring workers into contact with many harmful substances and microorganisms that are harmful to a person's health. It is important to maintain personal hygiene at work.

The following minimum standards should be followed by all workers at all times:

- Wash hands and other exposed parts of the body before handling food or drink, before smoking and at the completion of the day's work.

- Wear proper clothing and footwear, which can be removed before leaving the work area, so that hazardous materials will not be spread away from the site. Clothing should be cleaned regularly.
- When working with hazardous dusts it is important to shower before leaving the site.
- Wash hands before leaving the toilet block. Use the soap and towels provided.
- Use rubbish bins provided for the disposal of food scraps.
- Don't spit.
- Apply a barrier cream to exposed areas of skin before handling harmful substances. This will prevent the absorption of the material into the skin and make it easier for you to wash it off.

Safety precautions

When working on-site, think *safety first* at all times:

- Always look up and check what is overhead.
- Do not infringe any safety rules or regulations.
- Take the safest, most direct route from one place to another.
- Keep access routes clear of obstructions.

PERSONAL PROTECTIVE EQUIPMENT (PPE) AND CLOTHING

PPE is the last line of defence to protect your health and safety from workplace hazards. It is the employer's responsibility to provide the PPE, clothing and training to protect the worker. It is the worker's responsibility to wear and look after the equipment provided.

PPE must be appropriate to each particular hazard. It must fit properly, and must be properly cleaned and maintained. It is designed and manufactured to provide protection from a specific hazard to a particular part of the body. No single design can be expected to provide protection from all types of hazards in the workplace.

PPE can be grouped according to the part of the body it will protect:

- *head*—safety helmets, sun hats;
- *eyes/face*—safety spectacles, goggles, face shields;
- *hearing*—ear muffs, ear plugs;
- *airways/lungs*—dust masks, respirators;
- *hands*—gloves, barrier creams;
- *feet*—safety boots and shoes, rubber boots;
- *body*—clothing to protect from sun, cuts, abrasions and burns; high visibility safety garments.

Identify hazards

To decide what PPE and clothing is required, you must first be able to identify the hazards involved. Types of hazards commonly identified where PPE and clothing are a suitable means of protection are:

- **physical hazards**—noise, thermal, vibration, RSI, manual and radiation hazards;
- **chemical hazards**—dusts, fumes, solids, liquids, mists, gases, and vapours.

Once the hazards have been identified, suitable equipment and clothing must be selected to give the maximum protection.

Head protection

Safety helmets

Wearing safety helmets on construction sites may prevent or lessen a head injury from falling or swinging objects, or through striking a stationary object.

Safety helmets must be worn on construction sites when:

- it is possible that a person may be struck on the head by a falling object;
- a person may strike his/her head against a fixed or protruding object;
- accidental head contact may be made with electrical hazards;
- carrying out demolition work;
- instructed by the person in control of the workplace.

Safety helmets must comply with AS/NZS 1801:1997, 'Occupational protective helmets', must carry the AS or AS/NZS label, and must be used in accordance with AS/NZS 1800:1998, 'Occupational protective helmets—Selection, care and use' (Figures 1.21 and 1.22).

When wearing a helmet the harness should be adjusted to allow for stretch on impact. No contact should be made between the skull and the shell of the helmet when subjected to impact.

Figure 1.21 Safety cap

Figure 1.22 Full welding helmet

Sun shades

The risk of skin cancer for building workers is increasing. The neck, ears and face are particularly exposed. Workers should wear sun protection at all times when working outdoors (including winter time).

Sun shades include wide-brimmed hats and foreign legion-style sun shields fixed to the inner liner of safety helmets, or safety helmet 'foreign legion sun brims' (Figure 1.23).

Figure 1.23 Fabric sun brim accessory for a safety cap

Eyes/face protection

The design of eye and face protection is specific to the application. It must conform to AS/NZS 1337:1992, 'Eye protectors for industrial applications'. The hazards to the eyes are of three categories:

- *physical*—dust, flying particles or objects, molten metals;
- *chemicals*—liquid splashes, gases and vapours, dusts;
- *radiation*—sun, laser, welding flash.

The selection of the correct eye protection to protect against multiple hazards on the job is important. Most eyewear is available with a tint for protection against the sun's UV rays, or may have radiation protection included (see Figures 1.24 and 1.25).

Face shields

Face shields give full face protection, as well as eye protection. They are usually worn when carrying out grinding and chipping operations. The shield may come complete with head harness or be supplied for fitting to a safety helmet (Figure 1.26).

Figure 1.24 Clear wide-vision goggles

Figure 1.25 Clear-framed spectacles

Goggles are important for use with spray painting and overhead paintrollers. They are also used when power mixing paints and adhesives (Figure 1.24).

Figure 1.26 Face shield

Hearing protection

You should always wear ear protection in areas where loud or high-frequency noise operations are being carried out, or where there is continuous noise. Always wear protection where you see a 'Hearing protection must be worn' sign, and when you are using or are near noisy power tools.

The two main types of protection available for ears (Figure 1.27) are:

- *ear plugs*—semi- and fully disposable;
- *ear muffs*—available to fit on hard hats where required.

Choose the one that best suits you and conforms to AS/NZS 1270:2002, 'Acoustic—Hearing protectors'.

Airways/lungs

The greater use of mechanical equipment and the use of chemicals for building construction work has increased the need for personal respiratory protection. Breathing contaminated or oxygen-deficient air creates a health hazard that can range from mild discomfort to chronic or acute poisoning, or even death.

The type of cartridge in a filter will define the type of protection it will give. Cartridge types can be identified by the classification ratings from AS/NZS 1716:2003, 'Respiratory protective devices',

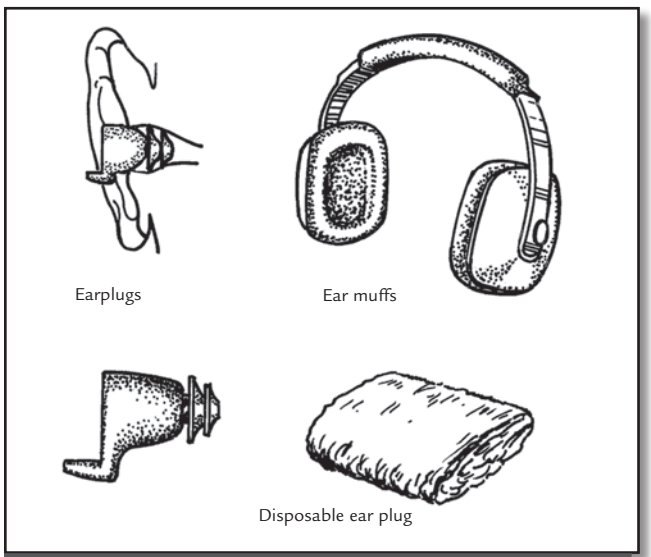

Figure 1.27 Hearing protection

e.g. a P2 class particle dust filter. It is important to learn about the wide range of face masks and respirators for various conditions.

Dust masks

Only high quality dust masks labelled P1 or P2 should be used in the construction industry (Figure 1.28).

Figure 1.28 Folding P1 dust mask with vent

Respirators

Half-face and full-face respirators can have filters designed to keep out dusts, smoke, metal fumes, mists, fogs, organic vapours, solvent vapours, gases, acids etc. These respirators may contain a combination of dust and gas filters to give full protection.

Respirators fitted with P2 class dust filters (formerly class M; Figure 1.29) are suitable for use with the general low-toxic dusts and welding fumes that are commonly found on construction sites.

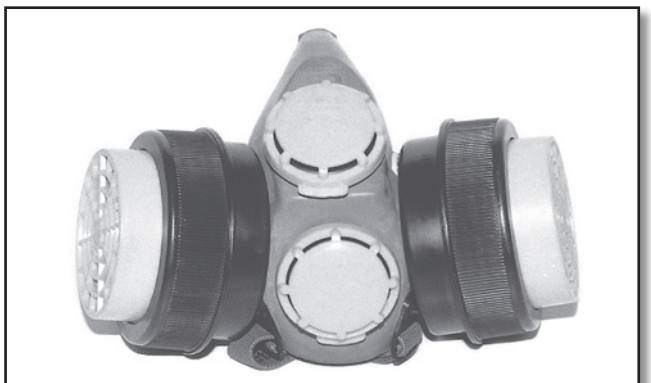

Figure 1.29 Half-face respirator with P2 class dust filters fitted

Further information on respirators and dust masks should be obtained from the suppliers. It is very important to be trained in the correct methods of selecting, fitting, wearing and cleaning of the equipment in accordance with AS/NZS 1715:1994, 'Selection, use and maintenance of respiratory protective devices'. Respirators and masks must be close-fitting to ensure that all air entering your respiratory passages has been fully filtered.

Hand protection

Hands require protection from both physical and chemical hazards.

Gloves

Gloves can be used to give protection from both physical and chemical hazards. Stout gloves are required when handling sharp or hot materials. Chemical-resistant gloves are used when handling hazardous chemical substances. Gloves should conform to AS/NZS 2161.1:2000, 'Occupational protective gloves—Selection, use and maintenance' (see Figure 1.30).

Figure 1.30 Gloves

Creams

Barrier creams may be used when gloves are too restrictive, to protect the hands from the effects of cement and similar hazards (see Figure 1.31).