



GUIDELINES
FOR
EVENT ORGANISERS
EXHIBITORS AND CONTRACTORS
ON
HEALTH AND SAFETY MANAGEMENT

JULY 2006

GUIDELINES

These guidelines are intended as a source of information on health and safety management. It does not purport to be comprehensive, or to render expert or legal advice.

It is the obligation of the contractor to comply with the appropriate legislation and/or standards.

The ASB Showgrounds does not accept responsibility for the accuracy or omissions of any statement, opinion, advice or information in these guidelines.

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PART 1: GENERAL

1.1 INTRODUCTION

This document has been provided to assist Event Organisers, Exhibitors, and Contractors meet their legislative health and safety obligations and to provide information on standards that must be observed while working within the ASB Showgrounds site.

All personnel coming onto the ASB Showgrounds property must abide by all relevant Legislation, Standards, Codes of Practice and the Auckland Showgrounds Site Safety rules.

The ASB Showgrounds Management team places a high priority on all safety issues within the Showgrounds.

The ASB Showgrounds reserves the right to stop or suspend all works if the health and safety obligations of contractors, their employees, or any individuals are not being met. Work can not recommence until evidence that health and safety obligations are being met. The ASB Showgrounds will not be responsible for any costs associated with any work stoppages, equipment damage loss, or costs associated with any inspection services.

1.2 EVENT ORGANISER, EXHIBITORS, CONTRACTORS

The hirer is the “Contractor” and “Person in Control of the Place of Work”. Both terms are defined in the Health and Safety in Employment Act 1992.

1.3 HEALTH AND SAFETY NOTICE

The ASB Showgrounds has implemented a Prohibition Notice and a Safety Improvement Notice system, which will be issued should a breach of the legislation or the ASB Showgrounds Health and Safety Site Safety Procedures.

These Notices will be issued when the ASB Showgrounds management team reasonably believes that circumstances causing, or are likely to cause, an immediate risk to health and safety have arisen, or are likely to arise, in relation to a workplace activity, plant or substance. This means that the activity or use of plant or substance can not proceed until the activity, plant or substance is deemed to be safe.

The Safety Improvement Notice (SIN) is issued on the spot for a breach of safety policy or procedures. It is intended to give the recipient immediate notice that their safety performance needs to improve.

PART 2: PROVISION OF FACILITIES

2.1: ATMOSPHERIC CONDITIONS

Comfortable atmospheric conditions in the workplace are essential for the health and well-being of employees.

Means should be provided in each workplace that, having regard to the processes and activities being carried on, effectively control atmospheric conditions within reasonably comfortable parameters.

A number of environmental factors are involved in the atmospheric conditions in any workplace and should be considered when deciding what control measures should be taken. These include room temperature, humidity, air velocity and amount of radiant heat plus the quantity of fresh air available. The physical activity of the people working in the room should also be taken into account.

Care should be taken in heating workplaces that no fumes are introduced that are likely to cause offence or harm.

Care is required to ensure heating systems are not a source of ignition to any process or activity nearby.

Where practicable, process factors should be controlled at source. If this is not possible then other options could include controlled microenvironments such as enclosures, or protective clothing, for example refrigerated suits. These allow employees to work in processes that cannot satisfactorily be controlled in the overall sense. Cool stores or steel mills are examples. In addition, work practices should be arranged to minimise contractors exposure to extremes of hot and cold. An example is limiting exposure periods, and the provision of and ensuring the use of, appropriate protective clothing and equipment.

2.2 COMMON FACILITIES AND AMENITIES

Where more than one workplace is contained within one building, the separate contractors could provide common facilities and amenities on the same scale as would be required if all persons were employed in a single workplace.

The facilities should be located in a convenient location within a reasonable distance of the work area.

Systems to ensure suitable access at all times are necessary, as are adequate arrangements for maintaining and cleaning the facilities.

Generally facilities shared should not be those in a private dwelling house as they will seldom be sufficiently accessible.

While this does not contemplate employees using public conveniences provided for the public by local authorities, shopping malls, taverns and similar, regard must be had for any special rulings made by the Building Industry Authority in respect of certain establishments.

2.3 DRINKING WATER

An adequate supply of free, cool, wholesome drinking water is required.

Water should be readily accessible to employees including, where necessary, provision for disabled workers.

Except where the water is delivered in inclined upward jets from which workers can conveniently drink, suitable cups or drinking vessels are required at each point of supply, together with facilities for cleaning them.

Drinking points should not be located in sanitary accommodation.

Any appliance used to cool drinking water should be regularly inspected, tested and maintained so that it cannot in itself contaminate that water.

Where water unsafe for drinking is provided for use in industrial processes or for fire protection, effective precautions to ensure no human consumption are necessary.

Precautions are required to ensure that any process or activity in the workplace does not contaminate drinking water supplies.

2.4 FIRST AID

The contractor should provide and maintain health services, first aid facilities, including first aid rooms) appliances and requisites in accordance with the requirements of the Factories and Commercial Premises (First Aid) Regulations 1985.

A first aid box or cabinet should be located close to washing facilities (including hot and cold water, soap and clean towels) and should be kept stocked with first aid equipment and materials appropriate for the work being undertaken and the number of persons employed.

The box or cabinet should be clearly identified, kept clean and tidy, and regularly replenished.

First aid supplies should be readily available at all times.

Where more than five employees are employed, a person should be appointed to take charge of the first aid facilities.

Formal first aid training should be encouraged, and where more than 50 persons are employed a registered nurse or the holder of a certificate issued

by the Order of St John, the New Zealand Red Cross Society, or a trainer with qualifications for the time being approved by the Secretary of Labour, is required.

Where more than 100 employees are involved, a first aid room is required.

Provision should be made to enable first aid delivery to any person who is injured or becomes ill while at work.

Emergency procedures should be developed and practised regularly.

First aiders should be aware of associated hazards such as hepatitis and human immunodeficiency virus (HIV) and the precautions necessary to protect themselves when administering assistance. They should also be aware of safe clean-up procedures of body fluids and soiled surfaces.

If workplace hazards require emergency washing facilities such as showers, hose attachments or eye fountains, then they should be readily accessible and close to the potential hazard.

2.5 LIGHTING

Lighting design should ensure a uniform distribution of light over the work area to help reduce visual fatigue and provide for the health and safety of all persons in the place of work.

To determine whether sufficient lighting is provided, the values set out in NZS 6703: 1984 should be used. Light value readings should be taken under both daylight and night conditions to determine the sufficiency and suitability of the lighting provided.

Lighting should be provided over the entire place of work, including amenity rooms, passages, stairs, ramps, ladders and gangways, which all should be capable of being lit at such times as people pass along or use them. People passing need not be employees, and could include other persons lawfully in the vicinity. For detailed work or where dangerous processes or machinery is used, higher lighting values will be required than in the general workplace. Localised lighting can meet this requirement.

All exits, not only normal exits, should be lit or be capable of being lit and, where necessary, adequate emergency lighting should be provided.

Outside areas should be satisfactorily lit for work and access during hours of darkness to provide safety and security. A place within the outer boundaries which is used only occasionally for work does not need to be lit constantly, but it should be capable of being lit while work is in progress.

The phrase “capable of being lit” means that electric switches should be so located that light is conveniently and immediately available, and that such switches should be readily identifiable.

In deciding what is suitable lighting, account should be taken not only of the amount of light provided, but also the surrounding brightness, wall colour, light distribution and glare.

Light coloured wall finishes can be used to improve brightness, or darker colours to reduce problems due to reflection, or arc welding flash, for example.

Artificial lights need to be shaded so as to control glare and reflect available light to where it is required. Where necessary, material should be applied to windows and skylights. Blinds, shades, or curtains should be used to reduce heat or glare.

Consideration should be given to any special conditions and other regulations and codes that have application.

The most common of these are specialised fittings and wiring standards applying to hazardous locations, such as spray booths, garage pits, dangerous goods workshops, and wet work areas.

Under certain lighting conditions (flickering from fluorescent tubes), revolving shafting wheels, and high-speed reciprocating parts can appear to be turning backwards, be turning slower than is the case or to be stationary. This optical illusion is known as the stroboscopic effect and its dangers to maintenance staff, machinery operators and passers-by are obvious. This effect is most troublesome and noticeable with fluorescent tubes, but can also arise with filament lamps.

2.6 MAINTENANCE OF FACILITIES

Every contractor should take all practicable steps to ensure that all facilities are clean and hygienically maintained, fit and suitable for use, and perform to the standard that they are designed or installed to achieve.

2.7 GENERAL PLACE OF WORK VENTILATION

All workrooms (which include work areas partially open to the atmosphere where ventilation can be controlled) should be ventilated by natural or mechanical means to provide a constant and sufficient supply of fresh air for the employees using the room.

The supply of fresh air and the removal of hazardous or unpleasant contamination from the air space are two objectives of general workplace ventilation.

The ability to readily control general ventilation is also of importance when managing atmospheric conditions in the workplace.

Usually the ventilation requirement for fresh air is very much less than that for the removal of contamination.

Consideration should be given to the consumption of fresh air for combustion by some heating systems, e.g. gas.

Window openings should, where possible, be placed to enable cross-ventilation. As a guide, when relying on natural ventilation windows should be equivalent to 10 percent of the floor area, and half should be capable of opening.

Doors are not an appropriate means of ventilation in themselves.

2.8 REMOVAL OF STEAM, FUMES, DUST AND OTHER CONTAMINANTS

Employees should be protected from the inhalation of any contaminant in the workplace.

Where practicable, dust, fumes, steam or other impurities which arise as a result of any process or in the course of the work should be removed at the point of origin.

Mechanical extraction appliances should prevent the contamination of any other workroom or place of work.

Where any process or other activity discharges or causes to be discharged into the atmosphere any air impurity to which the Resource Management Act 1990 applied, contractors should ensure that the discharge conforms to the requirements of that Act.

With regard to hazard control, where elimination or isolation of people from the contamination is not practical, the hazards should be minimised.

Minimisation requires the following:

- Monitoring of the contractor's exposure to the hazard;
- Provision with and ensuring the use of suitable protective clothing and equipment;
- Monitoring (with the contractor's informed consent) the contractor's health in relation to the hazard; and
- Any other practical steps be taken that could minimise the effects of the hazard on the contractor.

Control measures could also include dilution ventilation, filtration, mechanical extraction systems or a combination of these.

When designing extraction systems, the design should ensure that contaminants are drawn away from the breathing zone of workers, not through it.

The relative toxicity of the contaminant is most important in deciding appropriate control methods, as are other characteristics such as flammability and corrosiveness. With regard to toxicity, reference should be made to the publication *Workplace Exposure Standards 1994*.

Matters relating to specific contaminants, including the parameters for ventilation as a means of control are found in parts of various regulations. These include the Asbestos, Abrasive Blasting, Spraycoating, Electroplating and Lead Process Regulations. Reference should also be made to the Building Code.

2.9 FIRE PRECAUTIONS

Contractors should ensure all places of work comply with the requirements of the New Zealand Fire Service in matters pertaining to fire safety. Such matters will include the number, type and placement of fire fighting devices, alarms and evacuation systems and facilities.

Effective procedures and methods of control are required to minimise the risk of or effect of fire and ensure the safety of all persons in the vicinity.

In workplaces in which there are processes or materials in the event of a fire are liable to burn with extreme rapidity, emit poisonous fumes or cause explosions, specific control precautions could be required.

Precautions could include the display of safety warning signs, for example those prohibiting smoking or the introduction of naked flames or any other source of ignition into those parts of the place of work.

The contractor should ensure that employees are suitably trained in the use and operation of portable or other fire fighting equipment provided at the place of work.

All fire fighting equipment, apparatus and warning signs should be regularly checked and maintained.

Fire and emergency egress exits should be kept clear, be easily identified and always capable of being opened from within.

Emergency procedures should be prominently displayed and practised at least annually.

Such procedures should be regularly reviewed and upgraded or modified as necessary.

PART 3: GENERAL SAFETY PROVISIONS

3.1 SAFETY GENERALLY

No person engaged or employed in any place of work should, without reasonable cause, do anything likely to endanger themselves or any other person.

No person engaged or employed in any place of work should interfere with or misuse any appliance, apparatus, clothing, convenience, device, equipment, guard, or other thing that is provided for ensuring the health and safety, of persons in any place of work.

Every person engaged or employed in any place of work should use any such appliance, apparatus, clothing, device, equipment, guard, or other thing, as required to ensure their safety and health.

Every person engaged or employed in any place of work should obey any instructions given to them for the purpose of securing their health and safety.

They should also report defects in any process, procedure, equipment, gear, enclosures, apparatus, plant, clothing, amenities, facility, or any other thing provided to ensure the health and safety of persons in the workplace.

3.2 CLEANLINESS

Contractors should ensure that the place of work is kept in a clean condition, free from refuse, waste, rubbish or any nuisance, and free from any smell or leakage from any drain or sanitary convenience.

Accumulations of dirt and refuse should be removed regularly and as frequently as required by appropriate methods such as washing, vacuuming or sweeping.

Dry sweeping should be avoided where harmful substances are present in the place of work, as they are likely to cause atmospheric contamination if disturbed. Where potentially explosive dusts are present, care should be taken to ensure contamination is not spread.

Vigorous sweeping, blowing of compressed air or any other method of cleaning which can raise a dust cloud should be avoided.

Windows, ledges and skylights should be kept clean.

Sanitary conveniences, meal rooms, rest or first aid rooms require particular attention.

Sufficient suitable containers for waste and refuse, fitted with a cover as necessary, should be available and be regularly emptied.

3.3 PREVENTION OF FALLS

Falls often result in serious harm or death and require particular attention in terms of appropriate control.

Effective means to ensure the prevention of falls should be provided.

Some examples are perimeter fencing and fall arrest systems such as static safety lines, safety harnesses and inertia reel systems or safety nets.

When practical, it is desirable to isolate people from the hazard using fencing rather than relying on protective equipment such as fall arrest systems.

Where fall arrest systems are provided, they should ensure any falls that occur are less than 1.5 metres.

Persons using such systems should not work alone.

Training is a vital factor in effective use and maintenance of this equipment.

Careful consideration should be given when work at height is being planned as regards the type and suitability of equipment used for access purposes.

Where such work is regular, permanent safe access should be provided.

3.4 SAFE MEANS OF ACCESS AND EGRESS

Safe means of access should be provided to and in every place of work.

All means of access or egress should be of sound construction, and by properly maintained.

Safe access should enable all persons, including the disabled, to move conveniently and safely throughout the place of work in the performance of their normal duties. Marked aisles or walkways help in defining access ways.

Safe and rapid egress should be provided from the place of work in an emergency.

Access for the servicing and maintenance of plant, machinery and buildings should also be provided.

Floors should be even, slip-resistant and free from obstructions.

All doors or other means of access or egress to places of work should be kept unlocked and clear from any obstruction while employees are actually working.

If for security reasons a door is required to be locked, it should be capable of being opened quickly from the inside without the use of a key, so as to allow quick and easy egress at all times.

Freezers, chillers, manholes and similar confined spaces should have effective means to ensure safe access and, in particular, egress.

Steps, stairs, and ramps should be provided where necessary with substantial handrails and suitable means to prevent slipping.

Openings in floors and pits should be securely fenced or covered. Mezzanine floors also require fencing, including midrails and toeboards.

Doorways, hatchways and openings in the place of work used for hoisting or lowering goods or materials should have secure fencing and handholds.

Basements whose area exceeds 100m² require at least two safe means of access remotely separated from each other.

Skylights and low level windows in multi-storey buildings should be glazed with shatterproof material or guarded to prevent falls.

Where there is a likelihood of any person inadvertently walking into or striking glazing protective barriers should be provided.

Clear glazing should be suitably marked or patterned for easy identification and warning and all doors clearly identified.

3.5 SAFETY IN CONFINED SPACES

A confined space may be defined as “any chamber, tank, pipe or space in which a worker may be required to go or work and in which hazards are present which may endanger their health”.

Before work is performed in any confined space in which noxious gases, flammable liquids or vapours, electromagnetic or ionising radiation or any other harmful substance or matter are present (or are likely to be present) the contractor should carry out tests to ensure the air quality and quantity is adequate to ensure the health and safety of any person going into that space.

Contractors should take all practical steps to safeguard the health and safety of any person who is required to enter or work in any confined space, or to assist in any activity that is associated with any confined space, by establishing a system which ensures the following matters are considered.

The evaluation of the atmosphere in the confined space will identify the hazard and assist in defining the appropriate control method, which can include:

- The continuous ventilation, or cleaning or purging of the confined space of any atmospheric contaminant.
- Pure oxygen should not be used for purging or ventilating purposes or as a substitute for compressed air in breathing apparatus.
- The provision of appropriate respiratory protective devices or self-contained breathing apparatus and adequate instruction and training in their use.
- The provision and use of suitable safety harness and lifeline.
- The appointment of persons outside the confined space to ensure the provision of communication, support, and rescue services to the person within the confined space.
- The supply and maintenance of suitable rescue and first aid equipment and instruction and training in the use of such equipment for those persons likely to enter the confined space for worker rescue purposes.
- The isolation of any dangerous moving parts.
- Appropriate measures to avoid risks due to electrical energy.
- Any other provisions or requirements identified as necessary.

Contractors should make a thorough assessment of the workplace to identify every confined space, which could present any danger to people if entered. These should then be categorised into those which are routinely entered and those which are not, but which could be under certain circumstances.

Freezers, chillers, manholes and similar confined spaces should have effective means to ensure safe access, and in particular, egress.

Appropriate procedures should then be developed to enable safe entry. These procedures should be formalised into an “entry permit” system, which includes the prevention of unauthorised entry.

If it is possible to carry out the work (or other reason for entering) from outside the space, then this should be done.

3.6 TRAINING AND SUPERVISION

Contractors should ensure that employees are not required to undertake any unsupervised work unless they have the necessary knowledge and experience to perform it safely.

Employees should also be trained in the safe use of all plant, objects, substances, and protective clothing and equipment they could be required to use or handle in that work.

Untrained workers or those in the process of training should be directly supervised by a person who has the necessary knowledge and experience and has been adequately trained themselves in the work to be done.

Groups of workers could be supervised by one person, depending on the hazards involved or the complexity of the work.

A record of the training given to workers, the skills they have attained and what further training could be needed should be kept.

3.7 OVERCROWDING AND AIRSPACE

Contractors should ensure that employees are not grouped together in a building so closely that they cannot work in a safe and healthy manner.

Workrooms should provide a minimum volume of 12m³ for each of the workers employed in it at any one time.

In calculating this area, no space should be taken into account unless it is properly lit and ventilated, and clear from all materials, goods and tools, other than those actually used or required by the persons employed in the room.

No space more than 4m from the floor should be taken into account; no access/egress way nor any gallery or mezzanine floor forming part of the room or opening onto the room.

Refer also to section 1.12, General place of work ventilation, section 1.13, Removal of steam, fumes, dust and other contaminants, and section 2.4, Safe means of access and egress.

3.8 WORKERS EMPLOYED UNDER LOADS

Contractors should ensure that where any person in a place of work is engaged in, employed at, or is in the vicinity of work being performed under something that has been raised or lifted, then supports or other devices should be placed or used to prevent that thing dropping or being lowered while the person is underneath.

The contractor should also ensure that anything sitting on the ground or tilted or partly in contact with the ground is on stable ground and cannot be undermined by the work being undertaken on it, so endangering any person.

Examples include using stands under motor vehicles or other heavy plant or equipment, ensuring hoists have anti-fall devices, identifying potential hazards associated with hydraulic or air line failure, and taking effective control measures.

3.9 LIFTING HEAVY LOADS

Contractors should ensure that no employee is required or permitted to lift, carry, or move by hand any load, object, or weight so heavy that its lifting, carriage, or movement would be likely to injure or cause risk of injury to them.

Contractors should be trained to know how to help prevent back trouble from lifting, by recognising:

- Early warning niggles that could be the first sign that extra care is necessary;
- That people vary in height, build and strength, loads vary in weight, shape and bulk. Therefore, it is impossible to set precise weight limits and every situation should be considered on its merits.

Contractors should be taught how to lift and carry correctly, and should know:

- Not to try to lift a load if it feels too heavy or bulky;
- To ask someone else to help; or
- To use lifting equipment if it is available;
- To keep their back straight;
- To bend knees and let the legs, not the back, take the strain;
- To face the direction in which they are going to carry the load to avoid twisting the spine;
- To take care when putting the load down and to keep the back straight.

3.10 PROTECTION FROM HARMFUL NOISE AND NOISE CONTROL

All contractors should take all practicable steps to effectively manage the hazards associated with excessive noise. The maximum levels of noise that people can safely be exposed to are set out in Regulation 11 of the Health and Safety in Employment Regulations 1995. Anything above these levels is excessive noise.

A systematic approach should be taken and should include the following steps:

- 1. Determine whether there is excessive noise** by:
 - (a) Carrying out an initial audit to determine the likelihood of noise problems;
 - (b) Confirming the results of the audit by carrying out a noise assessment by measurement. If the noise levels are excessive, ensure employees are adequately protected.
- 2. Develop a plan of how the noise problem should be managed** (*noise management plan*) and this should include the following aspects:
 - (a) Eliminate excessive noise emitted by:
 - Reducing the noise being emitted to a level below the exposure limits by modifying existing equipment and machinery. An example of this is replacing noisy transmission gears with “v” belt transmissions;
 - Reducing the noise being emitted to a level below the exposure limits by replacing noisy equipment and machinery with quieter types. For example, replace a noisy piston-type compressor with a screw-type model;
 - Reducing the noise being emitted to a level below the exposure limits by changing the process. For example, replacing a hammering operation with a pneumatic or hydraulic press, which applies the force slowly and eliminates the impact noise created by hammering.

- (b) Isolate noisy equipment from employees by:
- Relocating the noisy equipment;
 - Using barriers and screens;
 - Enclosing the equipment in a suitably designed enclosure; or
 - Relocating employees in a quiet room or area.
- (c) Minimise the effects of excessive noise on employees by:
- Reducing noise levels to the lowest practicable levels even where the end result will still be excessive noise;
 - Modify work schedules to reduce employees' exposure to noise; and
 - Put in place systematic procedures for the protection of employees where they are exposed to excessive noise.
- (d) Develop a *hearing protection programme*, which should include:
- Regular monitoring of noise levels and noise exposure levels of employees still exposed to excessive noise; and
 - Regular hearing tests (with the informed consent of the individuals involved) on employees who are exposed to excessive noise.
- (e) Where excessive noise is present contractors should communicate clearly by way of signs, labelling of machinery, or other means the following information:
- The fact that noise levels in that place of work are or likely to be hazardous; and
 - The type and grade of hearing protectors for that area and where this protective equipment may be obtained.
- (f) Provide training for employees, which should include:
- An overview of, noise, hearing, the noise management plan and the hearing protection programme detail;
 - Correct use and maintenance of noise controls of machinery;
 - Reasons for wearing hearing protectors; and
 - Selection, use and proper fitting of hearing protectors, including the importance of constant use and maintenance of hearing protectors.
- 3. Regularly review both the noise management plan and the hearing protection programme.**

3.11 ELECTRICAL INSTALLATION SAFETY

All electrical equipment, fittings, tools and wiring used in connection with any work carried on in any place of work should comply with the requirements of the Electricity Act 1992 and Regulations.

Occupiers should ensure that they obtain certificates of compliance on completion of electrical wiring work.

3.12 PORTABLE ELECTRIC EQUIPMENT

Where any portable electric power-driven equipment is provided, the contractor should ensure that all such equipment:

- Conforms to the requirements of the Electricity Act 1992 and Regulations unless the supply authority otherwise approves;
- Is connected to its electric supply point by a flexible heavy-duty extension cord as described below:
- Where joined, is joined in a manner approved by the supply authority.

The following suggestions if adopted will improve safety:

- Extension cords should be protected or kept clear of the floor or ground so as to prevent damage or injury;
- Extension cords should not exceed 50m in length;
- Connection plugs and sockets should be of a type that cannot be rewired.
- An isolating transformer or residual current device (current-operated earth leakage detector) should be used.
- A contractor should ensure that where a plug board or double adaptor is used, it is suitable for the purpose.
- Portable power tools should be correctly guarded, maintained and used as recommended for the purposes for which they were designed.
- Protective clothing and equipment is often necessary, thereby requiring employees to receive training in the safe use of both the equipment and the protective devices.

3.13 SIGNS, COLOUR CODING AND AISLE MARKING

Suitable safety warning signs should be provided in areas where there are hazards, which are not readily apparent. The signs should be displayed in such positions as to be clearly visible to persons working in or entering the area. Areas that need warnings can include:

- Chemical hazards;
- Eye hazards;
- Falling object hazards;
- Foot hazards;
- Hot process hazards;
- Ionising hazards;
- Machinery hazards;
- Noise hazards;
- Radiation hazards;
- Traffic hazards.

Other signs can be used to indicate designated areas or access and egress provisions, e.g. access for persons with disabilities.

The provision of signage is not in itself a means of controlling the hazard; rather it is one possible component of a control system.

Colour coding can be used to indicate hazardous and non-hazardous piping, designated areas, first aid and fire fighting facilities and equipment, traffic areas, process areas, storage areas, including specific colouring of containers and drums, etc.

Aisle marking can be used to indicate traffic and pedestrian ways, storage areas, process areas, fire fighting equipment, etc.

3.15 DUTIES OF DESIGNERS, MANUFACTURERS, SUPPLIERS AND SELLERS OF PLANT

Designers of plant are required to take all practicable steps to ensure that plant and machinery they design, and that is to be used in a place of work, is designed so that it will not be a source of harm to any person during manufacture, use and maintenance. In the design process, consideration shall be given to applicable ergonomic principles especially in the placing of power controls.

Adequate information shall be given to the manufacturer concerning the use for which it was designed, installation, use, adjustment, maintenance, repair, cleaning, dismantling and any other relevant matters.

Manufacturers are required to ensure that if the plant is manufactured and tested to the design, used for the purpose for which it is designed, that its installation, use, adjustment, maintenance, repair, cleaning and dismantling will not cause harm to any person.

Manufacturers, suppliers and sellers of plant and machinery shall provide clear and comprehensive information to any purchaser or hirer concerning the use for which it was designed, manufactured and tested and information on its correct installation, use, adjustment, maintenance, dismantling, repair and any other relevant matters.

3.16 DUTIES OF DESIGNERS, MANUFACTURERS, SUPPLIERS AND SELLERS OF PROTECTIVE CLOTHING AND EQUIPMENT

Designers of protective clothing and equipment are required to take all practicable steps to ensure that it is designed to ergonomic principles and, if manufactured and properly used for the purpose for which it was designed, in accordance with the designer's instructions, it will give adequate protection from the harm against which it is intended to protect.

Adequate information shall be given to the manufacturer concerning the installation, use, adjustment, cleaning, maintenance, repairing and dismantling of clothing or equipment in accordance with the designer's instructions.

Manufacturers are required to ensure that every supplier and seller of protective clothing and equipment receives clear and comprehensive information concerning the use for which the clothing or equipment is designed; details on its installation, use, adjustment, cleaning, maintenance, repair and dismantling; and any other relevant matters.

Suppliers and sellers are required to ensure that every purchaser or hirer of protective clothing and equipment receives clear and comprehensive information concerning the use for which the clothing or equipment was designed; details on its installation, use, adjustment, cleaning, maintenance, repair, dismantling; and any other relevant matters.

Manufacturers, suppliers and sellers are required to ensure that clothing and equipment is designed, manufactured and tested so that if the clothing and equipment is used for the purpose for which it was designed and installed, used, adjusted, cleaned, maintained, repaired and dismantled according to the designer's instructions, it will give adequate protection from the harm against which it was intended to protect.

Every manufacturer, supplier and seller of protective clothing and equipment is to ensure that, to the extent that it is practicable, the clothing and equipment is permanently marked with clear and comprehensive relevant information concerning the use for which it has been designed; and how to install, use, adjust, clean, maintain, repair and dismantle the clothing and equipment in accordance with the designer's instructions.

3.17 RESTRICTION ON THE EMPLOYMENT OF YOUNG PERSONS

Hazardous work

No contractor shall employ any person under the age of 15 in a place where goods are being manufactured for trade or sale.

Persons under the age of 15 may visit factory workplaces if under the direct supervision of an adult or on a guided tour with the prior permission of the person in charge of the operation.

Night employment

Every contractor shall take all practicable steps to ensure that no person who has not attained the age of 16 years is employed between the hours of 10pm on any day and 6am on the next day, unless the employee's employment is in accordance with an approved code of practice relating to work of that kind or description.

PART 4: HAZARDOUS SUBSTANCES AND MATERIALS

4.1 PROTECTIVE CLOTHING AND EQUIPMENT

Contractors should provide for workers who are engaged in any process or activity that involves a risk of bodily injury to them, or a danger to their health, the protective clothing and equipment necessary to afford them reasonable protection against that risk or danger.

All protective clothing and equipment should comply with the relevant standard to ensure it provides the protection it is intended to (see below).

Protective clothing should be considered as the last option where engineering or management controls cannot completely eliminate or isolate the hazard at source. "Protective clothing" means any item of clothing worn to provide protection for the wearer against one or more of the following hazards:

- Harmful liquids, gases, vapours, dusts, powders, toxins, organisms and the like;
- Harmful radiation (both ionising and non-ionizing);
- Extremes of temperature outside the normal ambient range;
- Impacts, vibrations, abrasions, cuts and the like;
- Poor visual conspicuity;
- Falling or slipping; or
- Electrical hazards.

Employees should be trained in the use of and maintenance of any protective clothing and equipment they should use.

Regular inspection and maintenance or replacement of defective clothing and equipment is necessary, and suitable storage will help ensure both hygiene and ready accessibility.

Protective clothing and equipment of a personal nature, such as hearing protection or footwear, should be provided on an individual basis.

When purchasing, have regard to individual fitting requirements. Bulk purchasing or, for instance, one model of earmuff may not ensure effective protection for all staff.

The effectiveness of protective clothing and equipment should be regularly assessed by monitoring employees' health and safety in relation to the hazard.

The contractor should ensure that employees use the protective clothing, and equipment provided by them so often as the circumstances for which they are provided arise.

Where there are authorised visitors to places of work where conditions require the use of particular protective clothing or equipment, then contractors are responsible for ensuring that such clothing and equipment is available to visitors to the same standard as for employees.

4.2 SAFE WORK ON LOOSE MATERIALS

Where any employee is required to work in, upon, or in the vicinity of any material that is capable of subsiding or flowing, in a manner likely to trap or engulf them, the contractor should ensure that there is provided a suitable safety harness or lifeline, securely fastened at its extremity, and sufficiently strong to enable the worker to be pulled from that material if trapped or engulfed.

Where any worker is required to use a safety harness or lifeline, a second worker should be in attendance at the end of the safety harness or lifeline ready to assist the worker using it, or raise an alarm, in the event of any emergency.

Emergency procedures should be practised and training provided in the use and maintenance of equipment used.

It should be recognised that mechanical means could be required to provide enough energy to pull the victim free.

Similar precautions are necessary in regard to confined spaces.

4.3 VESSELS CONTAINING LIQUIDS

Where in a place of work there is any enclosure, vat, pan, fixed vessel, structure, sump or pit that contains any liquid, then contractors should ensure that either a secure fence that extends at least 1m above the adjoining ground, floor, or platform; or a suitable cover is provided to ensure the safety of all persons in the vicinity.

Wherever practicable, a means should be provided to enable any person who might fall into any such tank to climb out. An example would be an internal ladder.

4.4 FLAME CUTTING AND WELDING

Hazards arise from:

- The use of welding gear and the use of the wrong equipment for the job;
- Direct contact with heat generated; electromagnetic radiation;
- Fires caused by the ignition of flammable material and nearby containers, often started by sparks or drips of molten metal; and
- Harmful fumes and gases generated during welding, including those from primer and paint layers, other surface coatings, the metals being welded or other surface contaminants such as chemical residues.

- “Flashbacks” – the unintentional and uncontrolled burning back of gas through the blowpipe mixer in gas welding and cutting. These result from the presence of oxygen and a fuel gas in the same supply line. The use of flashback arrestors can virtually eliminate this problem, and these are described in the OSH booklet *Welding Safety*.

Arc welding

Severe and sometimes fatal electric shocks can occur with electric welding apparatus which is designed to operate from a mains supply, either single- or three-phase. The following precautions should be taken:

- Provide fuse protection and mechanically interlock the switch fuse or isolator with the socket outlet so that the plug cannot be inserted or withdrawn with the switch in the on position;
- Earth the work piece to protect the operator in the event of an inter-winding fault between the primary and secondary windings of the transformer. A robust flexible cable terminating in a clamp connected to the work pieces with its other end attached to the metalwork or earth terminal of the power source, is an efficient means of earthing;
- During MIG (metal inert gas) welding, prevent contact between the electrode wire and any earthed metalwork to avoid heavy welding current flowing through the earth continuity conductor and destroying it. Use a safe design such as an insulated spool in an insulated chamber in the power source with the wire being fed through insulated rollers and a tube inside the welding cable, to the torch; and
- Maintain the electrode holder welding current return cables, clamps and safety earths in good condition.

Radiation hazard

Prevent exposure to direct and reflected ultraviolet light and infrared rays by wearing protective clothing, and using welding screens. Use welding screens and wear eye protection to prevent arc eye.

Fumes and gas hazards

Use local exhaust ventilation wherever possible and always in confined locations. Mobile extraction units with flexible exhaust hoods and trunking can remove fumes and gases from most locations. These could need to be supplemented by personal protective equipment such as facemasks or respirators.

Fire hazard

Remove adjacent flammable material before flame cutting or welding. Check that nearby containers will not be affected, empty and remove any which are near or shield them particularly when welding or flame cutting.

4.5 SAFETY IN REFRIGERATED COMPARTMENTS AND PLACES WHERE ELECTROMAGNETIC OR IONISING RADIATION IS GENERATED

In any place of work in which there is a chamber, tank, pipe, room, or other space, in which the temperature of the atmosphere, the level of electromagnetic or ionising radiation or any atmospheric contaminant exists, or could exist, that is likely to harm an employee trapped inside it, the contractor should ensure:

- There is either an opening through which any person inside it can readily escape; or
- A door which can readily be opened by any person inside it, even if the door is securely locked from the outside.

Permanent means of indicating the door's position, such as luminous direction notices or pilot lights should also be provided.

See also section 2.5, Safety in confined spaces.

4.6 PRECAUTIONS WITH RESPECT TO EXPLOSIVE OR FLAMMABLE SUBSTANCES

Contractors should take all practicable precautions to prevent the explosion of any dust, gas, mist, vapour, fume, or any other substance present in the workplace.

Precautions include the effective enclosure of all plant producing or holding the substance; the removal or prevention of accumulations of the substance, and the exclusion or effective enclosure or isolation of all possible sources of ignition.

It is important to restrict the potential spread and effect of any explosion.

This can be achieved by ensuring all the equipment generating or collecting the substance is either sufficiently strong to withstand the effects of any explosion, or is protected by the provision of devices or systems such as chokes, baffles or vents. Water, inert gas or other extinguishing systems are other alternatives.

Any system used should not be capable of becoming a hazard to any person when activated.

4.7 STORAGE OF MATERIALS

Contractors should take all reasonable steps to ensure that all goods, materials, substances, and equipment in workplaces are so stacked, stored, secured and kept that they do not constitute a danger to persons in their vicinity, in the event of an earthquake or during the course of daily operations.

Such steps should ensure that they cannot, whether of their own accord, or by virtue of any external force (intentionally applied or otherwise), so flow, move, roll, or collapse, and endanger persons in their vicinity.

All workers who are responsible for stacking, storing, securing, or keeping or removing any goods, materials, substances, or equipment require full training in safe methods of doing so.

Where manual stacking or storage is appropriate, work methods should be designed to ensure that individual loads are not excessive, resulting in injury.

Where machinery such as forklifts are used, particular attention is needed in terms of operator training and machinery maintenance.

Materials handling equipment is becoming increasingly diverse, ranging from hand trolleys to sophisticated warehouse robots. It is important to ensure that the potential hazards such equipment can introduce are identified and effectively managed.

Stacks should be positioned with clear and adequately illuminated passageways between them to allow safe movement of persons or vehicles used in the process.

Good housekeeping is a vital component of a safety system.

Shelving columns, particularly on steel racking systems, should be provided with protection against vehicle impact.

All storage containers, pallets and similar equipment used for handling, transporting or storing materials should be well maintained and free from sharp edges, projections or rough surfaces that are likely to injure any person working near or passing by them.

Where practical, make use of marked aisles or walkways to maintain safe movement about any stored goods or materials.

Safe means of access is required to all shelving. Care should be taken to ensure shelving loading capacities are not exceeded and that shelves are suitably anchored.

Floors or surfaces required to support stacks, shelving, racks or other means of storage should be capable of sustaining the intended load together with shock loads.

Fire safety and the segregation of incompatible materials and chemicals should be considered, as should the accessibility of emergency evacuation.

4.8 STORAGE OF HAZARDOUS SUBSTANCES

Contractors should ensure that every container in a place of work which holds any material or substance that is corrosive, irritant, toxic, radioactive, explosive, or otherwise capable of endangering the safety or health of any person who may come into contact with it is suitable for the material or substance being held, and where required, approved for such storage.

Such materials or substances should be safely and securely stored; clearly labelled and, where necessary, containers containing incompatible materials and substances should be properly isolated from each other.

Material safety data sheets (MSDS) should be available in each workplace for all stocks and appropriate training and protective clothing/equipment provided. Eye injuries by chemicals form a large part of total industrial eye injuries.

The storage, use and disposal of used chemicals and substances requires careful consideration from both an environmental and safety perspective.

Chemicals can be inhaled, absorbed through the skin or ingested (swallowed). These three entry routes should be considered when designing suitable control methods and providing protective clothing and equipment.

4.9 ELIMINATING HAZARDOUS SUBSTANCES

Every contractor is required to take all practical steps to eliminate significant hazards. Where elimination is not practicable, isolation and minimisation of the hazard should be considered. Contractors should eliminate, or at least to adequately control, employees' exposure to hazardous substances.

One of the best ways to do this is to replace or substitute the hazardous substance or process with a less harmful one, so eliminating or reducing the risks and avoiding problems before they arise.

Contractors need to be able to successfully switch from the use of hazardous to less harmful substances, and the following seven easy steps may assist those contractors considering substitution:

- Identify the dangers; assess the risks in the use, storage and disposal of the present substance; and assess the risks in the present process.
- Identify alternative substances or processes that can be used; then obtain information on the dangers associated with them from manufacturers, suppliers, trade associations or government departments.
- Study the alternatives, with health, safety and environmental considerations in mind.
- Compare the alternatives (and their risks) with each other and with what happens now.
- If change would be an improvement, decide how and when to bring in the substitute (after, where possible, testing it in a small way first).

Making the change needs careful planning and it is vital to give staff the right information and training. Look closely at the change to see if it has been successful; checking should be ongoing to keep pace with progress, one day the substitute may itself be replaced by an even safer alternative.

4.10 SAFE USE OF HARMFUL SUBSTANCES

Where in a place of work harmful substances in solid, liquid or gaseous form are manufactured, handled, or used, or in which flammable, infectious, irritating, offensive or toxic dusts, fibres, fumes, gases, mists or vapours, are generated or released in quantities liable to injure health, contractors should ensure that all practicable steps are taken to protect employees from any resulting harm.

Employees should be made aware of the dangers of any harmful substances handled or used in the place of work, and should be trained in the precautions to be observed when handling or working with such substances.

In these situations, the atmosphere of workrooms and of partly enclosed working areas should be tested regularly by a competent person to ensure that the concentration of irritating or toxic dusts, fibres, fumes, gases, mists or vapours is kept within acceptable workplace exposure standards (see below).

Hazard-specific personal protective clothing and equipment should be provided and maintained and training given in its correct use and care.

The contractor should provide and maintain in easily accessible locations, for immediate emergency treatment in case of accident or sudden illness, suitable and adequate first-aid facilities appropriate for the nature of the hazard associated with any harmful substance.

These first aid facilities need not be in addition to those provided for general use (unless there is a particular necessity), but should be in charge of a person trained in their use.

At least one person trained to provide first aid should be available on each working day or shift unless appropriate alternatives are available.

4.11 WORK WITH COMPRESSED AIR AND HIGH-PRESSURE EQUIPMENT

Contractors should take all practicable steps to prevent accidents occurring due to the use of compressed air hoses, pipes, outlets, or other similar high pressure equipment.

All equipment used in connection with compressed air or high pressure equipment should be soundly constructed and properly stored, maintained, and comply with the appropriate New Zealand Standard.

Air lines should be suitable for the pressure or connected to a pressure control device.

All gauges and control devices should be regularly checked against a master pressure gauge. Damaged or faulty equipment should not be used.

All tyres should be deflated before removal from the vehicle's wheel rim, and only inflated while they are restrained in a properly constructed cage guard or other suitable restraining device.

No hand-operated air line should be left unattended while it is in use. Hand-operated air lines should be fitted with a valve or self-sealing device.

All pressurised oxygen equipment should be kept free from contamination from dirt, oil and grease.

The use of pure oxygen can be extremely hazardous and precautions need to be taken. Pure oxygen should not be supplied to breathing apparatus used in confined spaces, or used for ventilation purposes or as a general alternative to compressed air.

Compressed air should not be used for blowing down or cleaning, clothing, equipment, machinery, or similar items or articles. No compressed air or high-pressure, nozzle, gun, or equipment should be pointed at any person.

All compressed air, or high-pressure equipment capable of being operated at a pressure exceeding 7000kPa (1000 psi), should be fitted with a deadman operating trigger.

PART 5: OCCUPATIONAL HEALTH

5.1 IDENTIFICATION OF OCCUPATIONAL HEALTH PROBLEMS IN PLACES OF WORK

Most work-related diseases occur over time, and the effects are often not immediately apparent. Health hazards are often less obvious than safety hazards, but the effects can be just as serious.

Typical occupational diseases include respiratory disease, skin disorders, hearing impairment, communicable diseases, musculoskeletal conditions, occupational cancer, and disorders resulting from the neurotoxicity of chemicals and solvents.

Recognising that a disease or condition is work-related is usually the role of an occupational physician or nurse.

Initial health screening will assist in the identification of those people who should not work in the process and set baseline health information for future reference.

Assessment of the work process to identify hazards and appropriate control strategies are essential.

5.2 GENERAL HYGIENE

Good hygiene practices should be observed, such as washing hands before smoking or eating. In some occupations, such as sewer workers or lead workers, this is most important. In many cases soap and hot water needs to be provided.

The use of barrier creams should not be relied on to maintain hygiene. In those industries which are particularly dirty, such as engineering, the use of hand cleaners is essential and will assist in preventing skin conditions such as dermatitis.

Education and health promotion programmes are necessary to educate employees in good hygiene practices.

5.3 PREVENTION OF INFECTION

In some occupations there is an increased risk of infection. Biological hazards include occupational exposure to pathogens such as hepatitis B virus (HBV) and human immunodeficiency virus (HIV) and other potentially infectious materials. Workers in the health care industries, such as hospitals and biological laboratories, should take special precautions to prevent infection.

Disease may also arise from contact with animals already infected, as seen in the group of infections referred to as zoonoses (animal diseases transferable to humans). Examples of these diseases are leptospirosis and orf.

5.4 MANAGING OCCUPATIONAL HEALTH

Contractors need to consider methods to reduce and monitor occupational health problems in their places of work. These may include employing a qualified occupational health nurse (that is, a registered general nurse with an occupational health nursing certificate) or other suitably qualified person such as an occupational hygienist to assist in:

- Assessing the workplace to identify hazards to health;
- Carrying out health surveillance and biological monitoring;
- Consulting other occupational health specialists where necessary;
- Developing control methods to prevent the hazards;
- Giving information and training about workplace hazards;
- Maintaining records;
- Providing health education, rehabilitation and other counselling;
- Supervising and training first aiders.

5.5 ADVICE TO EMPLOYEES

Contractors should provide information, education and training for employees in occupational health, specifically on what they can do to protect their own health at work. Employees should be encouraged to:

- Read labels carefully and follow all instructions;
- Satisfy themselves that material safety data sheets from all suppliers are provided. Where this information is in a form not easily understood, additional information clarifying the issues should be sought.
- Seek information on other substances they use at work.

Employees should be trained to protect themselves, and know:

- How to use protective equipment like gloves, goggles, earmuffs or respiratory protection where necessary to protect health;
- How to maintain and look after their protective equipment.

Employees should be encouraged to maintain a high standard of hygiene and understand the benefits of:

- Not wearing contaminated clothing (where work clothes become heavily soiled, a laundry service provided by their contractor is preferable to taking the clothing home);
- Always washing hands before eating, drinking or smoking;
- Keeping the workplace clean and tidy;
- Not eating, drinking or smoking in hazardous work areas.

Employees should know what to do if they suspect something at work is causing ill health, and be advised to inform the contractor or supervisor without delay.

5.6 STRESS

Stress at work can be a contributing factor to many health-related conditions. Work-related stress is also thought to have negative effects on interpersonal relationships, job satisfaction, and productivity, as well as life outside the workplace.

In order to manage stress the contractor should identify those aspects of the work environment that may have adverse effects on the health of employees.

These aspects may include, but are not limited to:

- Job and performance demands;
- Interpersonal relationships;
- Job content and workload (e.g. monotony and overload);
- Physical environmental problems (e.g. noise and poor lighting);
- Organisational policies and other similar issues;

- Complexity of the job;
- Job dissatisfaction;
- Lack of job security.

5.7 OCCUPATIONAL OVERUSE SYNDROME (OOS)

Occupational overuse syndrome is an umbrella term that refers to a range of conditions which affect the muscles, tendons and ligaments, usually in the upper limb. Sustained excessive muscle tension is currently regarded to be the cause of OOS.

Relaxation in its many possible applications is the best approach to OOS prevention.

This relaxation can be encouraged by:

- Providing proper workstation design;
- Encouraging and promoting correct postures and actions;
- Organising and designing work so that people are not required to work beyond their own capacity;
- Providing opportunities for breaks and building in recovery time;
- Training employees so that they can identify and avoid improper habits (for example carrying out tasks with the shoulders raised).

There are many other ways of preventing and remedying OOS and these are explained in the documents listed below.

5.8 ERGONOMICS AT WORK

Ergonomics is the scientific study of the relationship between people, the equipment they use, and the environment they work in. Ergonomic design is the application of this knowledge to the design of tools, machines, systems, tasks, jobs and environments for safe, comfortable and effective human use. The fact that people are able to use poorly designed equipment, often under difficult working conditions, shows that people are adaptable, but there is a limit to the amount of adaptation a person may reasonably be asked to make. The cost can be in terms of efficiency in a doing a job, discomfort, frustration and dissatisfaction on the part of the user, and the potential for accidents and personal injury. A user-centred approach to design and evaluation may avoid these problems and result in:

- Lower injury and accident rates;
- Greater user comfort;
- Greater user acceptance;
- Improved reliability;
- Fewer errors and mistakes;
- A general increase in job satisfaction;
- Less absenteeism;
- Increased productivity;

- Improved safety;
- Reduced fatigue and strain.

5.9 CHANGES IN WORKING HOURS AND SHIFT WORK

Contractors should not require people to work excessive hours or unsuitable shift patterns likely to lead to ill health or accidents caused by fatigue. Work schedules should also allow for adequate rest periods.

Changing from normal working hours to non-traditional work schedules, such as rotating shifts and night shifts, disturbs internal body rhythms which may have safety implications or may lead to a variety of health-related ailments.

Shift work requires biological adjustments, sleeping at odd hours, eating at different times, and it can have a big impact on family and social life.

Contractors proposing changes in employees' working hours should consider a number of points beforehand so that new working patterns are introduced as smoothly as possible. These include:

- Consulting with employees are involving them in designing the changes;
- Provision of first aid rooms, canteens, tea rooms and similar facilities during the shift;
- Provision of training in the correct practices and procedures relevant to shift work; and
- Referring to appropriate reference material and, where necessary, engaging the services of an expert in this field.

5.10 VIOLENCE AT WORK

Violence at work is an increasing problem. Incidents arise where:

- Interpersonal relationships between employees break down;
- People deal with the general public in a stressful situation;
- There are improper or uninvited interpersonal contacts;
- There is a threat of robbery (armed or not).

Contractors should take all practicable steps to prevent and deal with violent situations at work. This can be achieved by developing systems and procedures to prevent incidents occurring, dealing with an incident when it occurs, and providing appropriate responses or counselling after an incident.

Employees should be encouraged to report any fear they have or any incidents to their contractors, who should treat the approach or incident in a sensitive and serious manner and ensure that it is suitably and fairly dealt with. Contractors should respect an employee's need for confidentiality and ability to raise issues without fear of discrimination or ridicule.

5.11 LANGUAGE AND CULTURAL CONSIDERATIONS

It is important that contractors recognise language and cultural issues, which may arise in the place of work. Contractors should take into account when providing information, training and supervision to employees, that the information should be provided in a way, which can be easily understood by the person receiving it. The needs of individuals should be considered when providing training and supervision in the place of work.

5.12 ALCOHOL AND DRUG DEPENDENCE

Dependence may arise through many situations facing people at work or home.

Such problems can lead to unhealthy and unsafe work methods or practices being used which may endanger the person concerned and others in the place of work.

As part of taking all practical steps to deal with this problem, contractors should have in place policies and procedures for dealing with such issues before and as they arise, as well as having in place procedures to provide help and advice to employees who may have a dependence on alcohol or drugs. The involvement of an occupational health nurse, industrial chaplain or the setting up of an employee assistance programme may assist contractors to deal with these issues.

The procedures and policies that are adopted to deal with these problems should be developed in close consultation with all employees in the place of work. Contractors should also have regard to the provisions of the Privacy Act 1993 and the New Zealand Bill of Rights Act 1990 when dealing with these issues.

PART 6: CONSTRUCTION

6.1 CONSTRUCTION WORK DEFINED

These guidelines have been developed to provide guidance in all of the situations described in the following definition of “Construction work”:

Construction work means any work in connection with the alteration, carrying out, cleaning, construction, demolition, dismantling, erection, installation, maintenance, painting, removal, renewal, or repair of any structure or structures of any one or more of the following kinds:

- (a) Any building, chimney, edifice, fence, structure, or wall, whether constructed wholly above or below, or partly above and partly below, ground level;

- (b) Any aerodrome, cable way, canal, harbour works, motorway, railway, road, or tramway;
- (c) Any drainage, flood control, irrigation, or river control work;
- (d) Any electricity, gas, telecommunication, or water distribution system or network;
- (e) Any aqueduct, bridge, culvert, dam, drive, earthwork, pipeline, reclamation, reservoir, tunnel, or viaduct, but excluding any adit, drive, tunnel, or underground working intended to be greater than 15 metres long, or any shaft intended to be greater than 4.5 metres deep;
- (f) Any scaffolding.

This includes:

- Any work in connection with any excavation, site preparation, or preparatory work, carried out for the purpose of any construction work;
- The use of any plant, tools, gear, or materials for the purpose of any construction work;
- Any such work carried out underwater, including work on buoys, rafts, ships, wrecks, and obstructions to navigation; and
- Any inspection or other work carried out for the purpose of ascertaining whether construction work should be carried out.

6.2 NOTIFIABLE WORK

Some construction works are considered to be more hazardous, and the regulations require notification to a health and safety inspector at least 24 hours prior to the commencement of the work.

Notifiable work means –

- (a) Any tree-felling or logging operation undertaken for commercial purposes in which one or more persons is employed or engaged.
- (b) Any restricted work as defined in regulation 2(1) of the Asbestos Regulations 1983;
- (c) Any construction work of one or more of the following kinds:
 - (i) Work in which a risk arises that persons employed or engaged in the work may fall 5 metres or more, other than –
 - Work in connection with a residential building up to and including 2 full storeys;
 - Work on overhead telecommunications lines and overhead electric power lines;
 - Work carried out from a ladder only; or
 - Maintenance and repair work of a minor or routine nature.

- (ii) The construction or dismantling or scaffolding any part of which is 5 metres or more above the ground;
- (iii) Work using a lifting appliance where the appliance has to lift a mass of 500kg or more a vertical distance 5 metres or more, other than work using a self-propelled mobile crane, an excavator, or a forklift;
- (iv) Work in any pit, shaft, trench, or other excavation in which persons employed or engaged in the work are required to work in a space more than 1.5 metres deep and having a depth greater than the horizontal width at the top;
- (v) Work in any drive, heading, or excavation in which persons employed or engaged are required to work with a ground cover overhead;
- (vi) Work on any excavation in which any face has a vertical height of more than 5 metres and an average slope steeper than a ratio of 1 horizontal to 2 vertical;
- (vii) Work in which explosives are used or in which explosives are kept on site for the purpose of being used;
- (viii) Work in which persons employed or engaged in the work breathe air that is or has been compressed, or a respiratory medium other than air;

Notification must be in writing, and an appropriate form is available from any branch office of the Occupational Safety and Health Service.

6.3 CERTIFICATES OF COMPETENCY

Certain prescribed classes of work or operations require people to hold certificates of competency, prior to that person being able to carry out the work or operate the particular type of device or equipment.

Certificates are issued for the following:

- Powder-actuated tool operators;
- Construction blaster (trained to use explosives);
- Scaffolders;
- Professional divers; and
- Restricted work with asbestos.

To obtain a certificate an applicant needs to be able to demonstrate that they have qualifications and training for the particular class of certificate applied for.

The regulations provide for the Secretary of Labour to recognise other agencies to issue these certificates. In the main these agencies will be

industry training organisations with responsibility for training within a particular industry.

PART 7: WORKING AT HEIGHTS

7.1 WORKING AT HEIGHTS OVER 3 METRES

The first and essential step in ensuring that work is done safely is to ensure that it is practicable for the work to be carried out safely.

Planning

Those engaged in the architectural and engineering design of buildings, structures, and roofs should consider the effects that their designs may have on the safety of people who will undertake the work and work practices necessary to carry out the work.

Safe work practices may include one or more of the following:

- Guarding;
- Safety nets; or
- Fall arrest systems.

7.2 PERIMETER OF WORKING PLATFORMS OR PLACES OF WORK

Where a danger exists of any person or any materials or any other things falling from the platform or place of work. Consideration should be given to how far a person or any materials or other things might fall.

No account should be taken of any structure or thing temporarily placed below the working platform or working place unless it constitutes a safe means of arresting the fall of the person or materials.

Guardrails should be erected along the exposed edge of the working platform or working place in accordance with the requirements of section 2.3 following.

Where the working platform or working place is situated above a public thoroughfare and a danger exists of materials or other things falling from the platform or place on to persons using the thoroughfare, then unless the area below the platform or working place is barricaded off to prevent public access, screens or projecting platforms should be erected.

7.3 GUARDRAILS/TOEBOARDS

Where protection is required at the perimeter of the building or openings in roofs, floors or lift shaft, and is provided by a guardrail system, the guardrail should:

- Be 900-1100mm above the working place;

- Incorporate a mid-rail; and
- Include the installation of a toeboard where there is a risk of tools or materials falling from the roof/place of work.

7.4 SAFETY NETS

Safety nets can provide a satisfactory means of protection against falling, while allowing workers maximum flexibility of movement.

In considering the use of safety nets as a fall protection measure, employers may take into account the usefulness of safety nets for the safety of persons in other occupations involved with the roof structure.

Workers installing the nets should be protected from falling. Ideally a mobile work platform (cherry picker, scissors lift) should be used, but where such mechanical access is not possible, the workers should have the protection of scaffolding or a safety harness and line.

Nets should be hung as close as possible to the underside of the work area.

Nets should be installed with sufficient clearance to prevent contact with the surface below when a person falls on them.

7.5 INDIVIDUAL FALL ARREST SYSTEM

Individual fall arrest systems include inertia reel systems, safety harnesses, lanyards and static lines. People required to use this equipment must be trained in its use.

Waist type belts should not be used for roof work.

People using safety harnesses should not work alone. It is important that the rescue of a worker who is suspended in a full body harness should occur within 20 minutes of the arrested fall.

Provisions must be made for anchorage points for static lines, inertia reel lines, and/or safety nets as appropriate.

Inertia reel systems

Inertia reel systems can be used to prevent falls where workers are required to carry out their work near an unprotected edge.

When considering the use of inertia reels, users should bear in mind that they may be less effective for certain applications, e.g. in arresting a person falling down the inclined surface of a pitched roof.

Inertia reels are not designed for continuous support but become effective in the event of a fall. They should not therefore be used as working supports by locking the system and allowing it to support the user during normal work.

Safety harnesses

Safety harnesses can be used as travel restriction systems to prevent workers moving from safe to unsafe areas on the roof or work platform.

Fall arrest systems should be designed so that when preventing a fall, the maximum distance a person equipped with a parachute safety harness would fall is within 1.5 metres.

Full body harnesses of the parachute type, connected to the lanyard or lifeline at the tope dorsal position, should be worn.

Individual fall arrest systems and safety harnesses should only be used with individual manufacturer's components known to be compatible.

7.6 WORKING ON ROOFS

Roof work should only be undertaken by persons who have the knowledge, experience and resources necessary for the work to be completed in safety.

Knowledge and experience are necessary before the work is taken on, as the person responsible for the work must consider what hazards are involved and how they can be overcome. In the planning and execution of the job, a safe system of work must be established, taking into account the type of equipment necessary, the experience of the workmen involved and the instruction and supervision required.

Even if the work will be of short duration, it is still necessary to identify the hazards and arrange appropriate safeguards. Where roof work is being carried out in circumstances where persons are liable to fall from the roof, precautions shall be taken either to prevent persons falling or, if this is impracticable, to prevent the fall from being the cause of serious injury.

In particular, when working on a roof the following points should be considered:

- The provision of anchorage points for static lines, inertia reel lines, and/or safety nets is appropriate.
- The roof structure is accessible for the installation of safety nets, anchorage points and static lines.
- Guardrailing or guardrail attachments are incorporated in the perimeter structure, especially prior to erection.
- The ground or floor below the roof area, including the perimeter, is prepared to provide a firm and level support for mobile equipment prior to the commencement of roofing operations.
- There is permanent access to the roof for maintenance and repair.
- The amount of work at height should be reduced as much as is practicable – for example, the use of sections pre-assembled on the

- ground and the installation of guard railing to perimeter structural members prior to hoisting.
- Protection against falling at the perimeter of the building can be effectively provided by the use of scaffolding and/or perimeter guard-rails.

Scaffolding, any part of which is 5 metres or more above the ground, shall be erected, altered or dismantled under the direct supervision of a certificated scaffolder.

Mobile and tower frame scaffolds can be used to provide a safe working platform while installing safety mesh, including the stapling or overlaps where purlin spacing is excessive.

Where a perimeter scaffold is erected, the platform height should be as close as possible to the working edge and the gutter or fascia level, and have rigid guard rails at a height of 900-1100mm above the gutter or fascia level.

7.7 BRITTLE ROOFS

Where not specifically identified as metal and in sound condition, roofs should be assumed to be covered with a brittle or fragile material and suitable precautions should be adopted.

Where a roof or part of a roof comprises fragile or brittle material the owner or occupier of the building should provide and maintain a warning sign at any place where persons can gain access to the roof.

Where it is necessary for maintenance to be carried out on a roof containing brittle materials, the employer or self-employed person required to carry out the work should:

- Inspect the underside of the roof to determine the extent of brittle roof material, existence of any safety mesh or sarking, and the structural soundness of the roof and any safety mesh;
- Provide temporary walkways where any person is required to work on the roof or use it as a means of access. (These walkways should be at least 450mm in width, and should incorporate a guardrail. Where the slope of the roof exceeds one vertical unit of measure to six horizontal, timber cleats of not less than 500mm by 12mm should be fixed to the top side of the walkway plants at distances not more than 350mm apart, centre-to-centre. The walkways should be adequately secured);
- Provide temporary roof ladders of sufficient strength where any person is required to carry out work on or adjacent to any part of a sloping roof sheathed in brittle material;
- Provide individual fall arrest systems, including anchorages for any person to work on or adjacent to any brittle roof sheathing, including work from roof ladders; and

- Provide training and instruction – in appropriate languages – and supervision to ensure the risk of falling is eliminated by the correct use of all protection equipment provided.

7.8 LADDERS

The use of ladders to gain ready access to work sites as a means of carrying out some work activity is a necessity on construction work. Employers, employees and others required to use ladders should:

- Select the most suitable type of ladder for the work to be carried out.
- Provide or be provided with appropriate training in the use of ladders.
- Restrain ladders at both the top and bottom to prevent accidental displacement.
- Position ladders as close as possible to the work.
- Where a ladder is used to gain access to a working platform, ensure that it extends 1 metre above the working platform.
- Store ladders so as to avoid sagging.
- Keep ladders clean and free from foreign materials.
- Use two people to carry heavy, long ladders.
- Place the feet of single or extension ladders $\frac{1}{4}$ of the ladder's working length away from the base structure.
- Use only step ladders with lockable spreader bars on both sides connected to the front and rear stiles.
- Not allow over reaching from any ladder. Where the work cannot be accessed from the ladder's position, the ladder should be moved to allow ease of access within the confines of the ladder.

7.9 ABSEILING

This is a technique used by a few specialised companies for gaining access to a place of work where other recognised means of access is not appropriate. Access is gained by means of rappelling down a rope fixed to a secure object, using a descent device and ancillary equipment.

People in this field of work should be in good physical condition and have a high standard of training.

Operation

There shall be at least two people on site where the work is carried out.

An effective method of communication shall be set up.

All ropes used should have their own identification and be checked regularly by the user or supervisor before each job.

Protection against fraying should be provided and inspected regularly by the user.

The fixed attachment for the rope is to be checked by a competent person before use.

The safety harness used should allow the user to be supported in a semi-sitting position.

An independent safety line should be attached between the person in the harness and a separate secure point of attachment.

Descent devices and their ancillary equipment should meet the appropriate standard.

Emergency procedures should be set up and discussed with all concerned – prior to the commencement of the operation.

7.10 SCAFFOLDING

Scaffolding is used throughout the construction industry to provide workers with a safe temporary working platform.

The requirements for scaffolding can be complex. Only persons who hold a certificate of competency as a scaffolder can erect a scaffolding any part of which is 5 metres or more above the ground.

It is important that a competent person inspect all scaffolding:

- Before it is used;
- At least weekly while it is in use;
- After bad weather or any other occurrence that could affect its stability; and
- After periods where the scaffold has not been used for some time.

The results of inspections should be recorded, including defects that were put right during the inspections. The records should be signed by the person who carried out the inspection.

The person carrying out such inspections should ensure the following requirements are met:

- There is proper access to the scaffold platform.
- All uprights are properly founded and provided with base plates. Where necessary, there should be timber sole plates, or some other means used to prevent slipping and/or sinking.
- The scaffold is secured to the building in enough places to prevent collapse and the ties are strong enough.
- If any ties have been removed since the scaffold was erected, then additional ties or other means of support should be provided to replace them.
- The scaffold is adequately braced to ensure stability.

- Load-bearing fittings are used where required.
- Uprights, ledgers, braces or struts have not been removed.
- Working platforms are fully planked, with the planks free from obvious defects such as knots and arranged to avoid tipping and tripping.
- All plants are securely restrained against movement.
- There are adequate guardrails and toeboards at every side from which a person could fall.
- If the scaffold has been designed and constructed for loading with materials, that these are evenly distributed.
- There are effective barriers or warning notices to stop people using an incomplete scaffold, e.g. one that is not fully planked.

Suspended scaffolding

Suspended scaffolding shall only be erected by a person who holds a certificate of competency for suspended scaffolding.

The following points should be observed when erecting or using suspended scaffolding:

- Hoisting ropes shall be anchored to a secure part of the structure, to outriggers, to specially designed brackets and parapet hooks or directly to counterweights.
- Guard rails, mid rails and toe boards shall be provided on both sides and both ends of suspended scaffolds.
- Every worker on a suspended platform shall wear a safety harness that is secured to a fixed support or to an independent lifeline.
- All suspended platforms shall be fitted with tilt switches which cut off the motors in the event of the platform becoming more than 10° out of level.
- Where suspended scaffolds are above thoroughfares, adequate and prominent warning notices shall be displayed.
- Where any special danger exists adequate protection of the public should be provided.
- The accumulation of surplus gear or materials on any suspended scaffold is hazardous and should be avoided.
- No persons are allowed to ride on the platform while it is being raised or lowered unless the controls on the platform are individually operated.
- A suspended scaffold register, record of inspection shall be kept on site and available for inspection by persons required to use the scaffold.

PART 8: ELECTRICAL

8.1 ELECTRICAL SUPPLY

Electricity is almost universally used on construction sites as a power source for a range of machinery and portable tools, as well as lighting and heating is in wide use on construction sites.

Portable electrical appliances shall be used in damp situations only with one of the following safeguards.

- A supply isolated from earth with a voltage between conductors not exceeding 230 volts;
- A monitored earth circuit where the supply to the appliance is automatically disconnected in the event of the earth to the appliance being broken or disconnected;
- The appliance is double insulated;
- A source connected to earth in such a way that the voltage to earth will not exceed 55 volts AC; or
- A residual current device.

8.2 TEMPORARY SUPPLY SWITCHBOARDS

All supply switchboards used on building and construction sites should be of substantial construction and should:

- Where installed in outdoor locations, be so constructed that safe operation is not impaired by the weather;
- Incorporate a stand for the support of cables and flexible extension cords;
- Be provided with a door and locking facility acceptable to the electrical supply authority. Doors should be designed and attached in a manner that will not damage any flexible cord connected to the board and should protect the switches from mechanical damage.

The door should be provided with a sign stating “KEEP CLOSED – LEADS THROUGH BOTTOM”.

- Have an insulated slot in the bottom for the passage of leads.
- Be attached to a permanent wall or suitable structure which has been designed for the purpose.
- Where pole or post mounted, be fixed by means of coach screws or bolts.

8.3 INSPECTION OF EQUIPMENT

All electrical tools and equipment should be inspected prior to their first use and thereafter at least at 3-monthly intervals.

All tools and equipment should have an identification tag stating the date of last inspection and when the next is due.

8.4 CLEARANCE FROM POWER LINES

No part of a crane, digger, excavator, drill rig, or other mechanical plant, structure or scaffold may be brought closer than 4m to an overhead line without the written consent of the power line owner.

PART 9: HAZARDOUS PROCESSES

9.1 FLAME CUTTING AND WELDING WITH 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 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.

Soapy water should be used to check cylinders and hoses for leaks. If a leak is found and it cannot be stopped, the cylinder should be removed to a safe place in the open air and the supplier contacted for advice.

Flash-back arrestors should be fitted to each hose.

Oil and grease should be kept away from oxygen cylinders hoses and work clothes, oxygen build-up can lead to sudden, fierce fires.

Lighting up procedure

The manufacturer's recommended procedures should be followed when purging hoses (to reduce the risk of flashback). The area needs to be well ventilated.

Cutting drums and tanks

Drums, tanks, etc. shall not be welded or cut without special safety precautions. If they contain even a small amount of petrol, solvent, oil or other flammable liquid, sludge or solid, they may explode.

To avoid this danger such containers need to be thoroughly cleaned and tested before any hot cutting or welding is carried out.

Alternatively, the container may be completely filled with water and the top removed.

Fumes

A significant health problem that can arise from welding is lead poisoning caused by flame cutting steel coated with lead-based paint. Welders and gas cutters can suffer metal fume fever through working with plated metal. 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 such as excavations, pits small basements and tanks.

Forced ventilation is essential in these situations. All employees who carry out welding or cutting where there is a risk of breathing dangerous fumes will need to wear appropriate respiratory protection.

Fire fighting and protective equipment

Flammable materials shall be removed from the work area and suitable fire fighting equipment provided.

Employees should wear suitable eye protection and protective clothing to protect against burns.

9.2 PORTABLE MECHANICALLY-POWERED NAILERS AND STAPLERS

The use of mechanically-powered nailers and staplers in place of the traditional carpenter's hammer is labour saving and also overcomes certain health hazards. But other hazards are presented through the use of compressed air, compressed inert gas or electricity as an energy medium at a force capable of penetrating body tissue.

Proper standards and the following of recommended work practices are therefore essential.

Employers are to ensure that the following safety rules are followed by all operators:

- Tools should never be pointed at any person, whether they contain fasteners or not.
- The operating mechanism or work-contacting element should never be depressed unless the nose of the tool is directed on a safe work surface or test material.
- Additional care should always be taken when nailing near the edge of material.
- No volatile or combustible gas is ever to be used to power a pneumatic tool. This includes **never using bottled oxygen**.
- Defective tools are never to be used.
- No operator is to discharge fasteners by bump nailing.
- Eye and hearing protection is appropriate for the tool and is used.

9.3 PORTABLE POWER TOOLS

Power saws, planers, cement mixers, concrete cutting tools, and other power tools shall have proper guards in place at all times. Employers, employees and others required to use power tools are to ensure that:

- Every operator is trained in the use of the tools.
- Only the right tool is used for the job and appropriate work methods are adopted.
- Defective tools are not used until repaired.
- Transmission guards shall be in place.
- Electrical safety devices are used where appropriate
- Cutting tools are kept sharp.
- Eye and hearing protection is appropriate for the tool and is used.

- Immediate floor areas around machines are kept clear.
- Extension cords are placed in such a manner to prevent damage from equipment or materials.
- Adequate lighting is provided to carry out the work.

9.4 PERSONNEL/MATERIALS HOISTS

A summary of main requirements of a personnel/materials hoist are set out below.

Erection should be carried out by a suitably qualified person.

Minimum specifications

The hoist may be tower or cantilever.

The hoist should be on proper foundations and tied to the building, or guyed, if necessary.

Access for the operator and maintenance personnel must be safe.

The car must be at least 2 metres high, with sides and doors solid faced or enclosed with mesh of 3mm diameter wire and a maximum opening of 9mm. It should be roofed with 18mm plywood or equivalent, and have a roof trapdoor.

The car door should be at least 2 metres high and have an effective lock. Solid doors are to have vision panels.

The distance from car platform to landing sill should be no more than 50mm.

Landing gates are to be at least 2 metres high and as strong as guard rails, and not readily detachable. The distance from landing sill to gate is to be 150mm or less.

Car and landing doors are to have electro-mechanical interlocks that can be released only from the car, that can be opened only when the car is at the landing, and that prevent hoist operation when open.

Towers inside structures should be enclosed by mesh, except at gates.

Hoist towers inside the structure are to be mesh or solid enclosed to at least 2 metres above the sill on sides used for access to and from the structure. At the lowest landing the structure should be enclosed on all sides to at least 3 metres high.

Over-run clearances are to be provided for car and counter-weights.

Only positive-drive mechanisms are to be used.

Hoisting is to be controlled from within the car.

All metal parts are effectively earthed.

Safety gear must be fitted to stop and hold the car under free fall and overspeed.

A notice of manufacture, model and load capacity is to be displayed in the car.

Rope size and servicing details are to be displayed on the driving machine.

Provision is to be made for emergency operation and the release of persons trapped.

There should be an emergency alarm inside the car (a gong and striker will suffice).

Where possible there should be a communication system between all landings and the hoist car.

Operation of hoists

Where the hoist operator controls the movement of the car at the hoist, protection should be provided above the operating position. This protection should be of appropriate construction and adequate strength to protect the hoist operator from material which could fall from the hoist or building structure. The size of openings of an infill, if used, should be not greater than 50mm square.

A signalling system should be provided at all landings where the operator does not have a clear, convenient view of all loading and unloading.

The operating controls of the signalling system should be set up at the landing gate giving access to the hoist.

Operators should be qualified and authorised to operate the hoist; and should take all reasonable steps each day to ensure that the hoist is in a safe operating condition.

Dangers from use of hoists

Provision should be made to guard against the following types of falls from a hoistway:

- From a landing level, e.g. a scaffold platform;
- From a hoist platform/cage;
- With the platform/cage because of operator error;
- With the platform/cage when the operating gear fails;
- Being struck by the platform/cage or other moving parts;
- Being hit by materials falling down the hoistway; and

- Being struck by landing levels or parts of the enclosure while riding the hoist.

9.5 CRANES AND LIFTING APPLIANCES

Cranes and other lifting appliances are valuable assets on construction sites. It is important, however, to pay regular attention to certain aspects of their operation. Employers and employees using cranes and lifting appliances should ensure that:

- Cranes are inspected weekly, and thoroughly examined every 12 months by a competent person. The results of inspections should be recorded.
- There is a current test certificate.
- The driver is trained, competent and over 18 years of age.
- The controls (levers, handles, switches, etc.) are clearly marked.
- The driver and dogman determine the weight of every load before lifting.
- Every jib crane with a capacity of more than 1 tonne has an efficient automatic safe load indicator that is inspected weekly.
- A hydraulic excavator being used as a crane has the maximum safe load clearly marked and hydraulic check valves fitted where required.
- The crane is on a firm level base.
- There is enough space for safe operation.
- The dogman has been trained to give signals and to attach loads correctly and knows the lifting limitations of the crane.
- If it can vary its operating radius, the crane is clearly marked with its safe working loads and corresponding radii.
- The crane is regularly and thoroughly maintained.
- The lifting gear is in good condition and has been thoroughly examined.

9.6 POWER-OPERATED ELEVATING WORK PLATFORMS

Elevating work platforms are specialised machines designed to provide safe access to high places of work.

It is important that any machine is used in accordance with the manufacturer's recommendations, and not outside their intended specification.

Uses of elevating work platforms

Machines designed for indoor work should not be used outside, where even moderate wind forces could overload and overturn them.

Where machines are used for supporting equipment for film or television recording, the weight of any electrical cables hanging from the bucket should be included in any load calculations.

Such cables are not to be treated as "jungle vines", and horseplay should be discouraged.

Work platforms are designed for lifting personnel and their hand tools. They are not cranes, and must not be used as such.

Machines must receive proper and thorough maintenance.

Setting up

Before use, the work platform must be set up with stabilisers or outriggers fully extended and levelled as specified by the manufacturer, and any stabilisers actuated. Where necessary, suitable metal or timber spreaders should be used to provide a firm base.

The stated SWL of the work platform assumes that the chassis of the machine is set up on firm ground and has been levelled. A machine may overturn at a lesser load if these conditions are not met.

The parking brake must be applied and the brake lock used where provided.

Where the working area is in a public place, it must be ensured that the work platform can not be hit by other vehicles, and is protected by barricades and warning signs. Pedestrians should not have to walk under the platform and, where necessary, the public excluded from the area by the use of barriers.

Where the work area is close to fixed obstructions, the operator should check that outrigger settings are appropriate for the load to be carried, and clearances are adequate, and that there is no danger of any part of the work platform coming into contact with live electrical conductors or other obstructions.

Operation

The safe working load (SWL) of any machine shall never be exceeded – it could overturn or components could be overstressed.

Machines shall not be positioned over people or employees, or others allowed to go under a working platform unless it is essential to the operation. On these occasions special safety precautions should be followed, and the machine never moved unless the way is clear and will remain clear.

A safety harness attached to the platform should always be worn. The safety belt or harness should meet the requirements of NZS 5811:1981 or an equivalent standard.

Safety devices, such as pressure relief valves, should not be adjusted or altered except by a competent person.

A platform shall not be used as a prop, tie or crane.

Platforms should never be moved close to overhead electric lines, unless the electrical supply authority has given permission in writing.

If any fault in the control system is suspected, operations should cease until the suspected fault is rectified.

Contact with power lines

If an **uninsulated** work platform comes into contact with live electrical lines or equipment, persons in the personnel buck **at the time**, should remain there. **The safest course of action is to do nothing until the line is de-energised or help arrives.** Only as a last resort should they attempt to jump clear.

If they decide to jump clear, they should:

- **If it is safe to do so**, operate the controls to break contact;
- Warn all persons to keep clear and call for assistance to de-energise the lines; or
- If contact cannot be broken, and assistance is unavailable, as a last resort leave the platform in the following way;
 - switch off the motor and apply brakes;
 - remove any loose clothing;
 - climb down to a point about a metre above the ground from where it is possible to jump safely to the ground;
 - **jump** so that they clear the platform **before** any part of them touches the ground;
 - Fall away from the machine and not towards it;
 - **Don't** retouch the machine until the lines are de-energised.

9.7 POWDER-ACTUATED HAND HELD FASTENING TOOLS

When using a powder-actuated fastening tool, operators have a responsibility to protect themselves and others from hazards associated with this type of work. These hazards can and should be managed. The operator of a powder-actuated fastening tool should manage the hazard through compliance with an approved code of practice in conjunction with any manufacturer's requirements.

The operator should comply with the following requirements regarding loading of a powder-actuated fastening tool with a charge and fastener:

- Only load the powder-actuated fastening tool at the place where it is intended to be used and immediately prior to its use.
- Only carry a loaded powder-actuated fastening tool when, because of mechanical failure, it cannot be unloaded.
- If the powder-actuated fastening tool has been loaded but not put into immediate operation, remove both the charge and fastener.
- During firing of the powder actuated fastening tool, operators should ensure that all persons required to be in the immediate vicinity of the firing activities, wear:
 - Suitable eye protectors complying with AS/NZS 1337; and
 - Suitable ear protectors complying with AS 1270.

9.8 CONFINED SPACES

“Confined spaces” are not limited to closed tanks with restricted means of entry and exit. Also included are open manholes, trenches, pipes, flues, ducts, ceiling voids, enclosed rooms such as basements and other places where there is inadequate ventilation and/or the air is either contaminated or oxygen deficient.

Before entry to any confined space it shall be tested to determine that there are adequate levels of oxygen present, and that dangerous amounts of flammable and or poisonous gases are not present. (Proprietary meters are available.)

No one is to enter any space if testing shows that the air is dangerous inside. Forced ventilation should be used to remove or dilute the gases and supply fresh air. The air shall be tested again prior to entering, and monitoring continued while work is being conducted inside the space.

Types of confined space

Confined spaces may be inherently unsafe. Alternatively, different types of work being completed in the confined space may also make the atmosphere dangerous.

Some examples of confined spaces in which the work being done can make the space dangerous, are given below:

- Some painting work, and the application of certain adhesives, and liquids such as paint thinners. These can produce dangerous amounts of solvent vapour, which can cause dizziness and impair judgement. Such solvents are often flammable, so there is an accompanying risk of fire.
- The use of LPG appliances and petrol or diesel engines can lead to the build-up of poisonous carbon monoxide gas. There is also a risk of fire resulting from leaks.

Among the confined spaces that may be inherently hazardous are:

- Manholes, tunnels, trenches set in chalk soil, which can partly fill with carbon dioxide gas, displacing breathable air.
- Poisonous or flammable gases can collect in manholes in contaminated ground (e.g. near underground petrol tanks or refuse tips).
- In manholes, pits or trenches connected to sewers, there can be a build-up of flammable and/or poisonous gases and/or insufficient oxygen in the air.

- Sludges and other residues in tanks or pits, if disturbed may partially fill the confined space with dangerous gases.
- Rotting vegetation, rusting metal work, and similar natural oxidation processes may lead to an oxygen-deficient atmosphere inside the space.

Precautions

If work in a confined space could be potentially dangerous, entry shall be strictly controlled and detailed precautions taken.

Preferably employers should adopt an entry permit system, so as to ensure that employees and others are aware of the location of anyone required to enter confined spaces. As mentioned above, tests may be required to identify any dangerous amounts of flammable or poisonous gases.

Where the work being carried out could cause danger:

- The hazard should be kept out of the confined space. For example, petrol or diesel engines should not be used inside the space, but sited outside of a well ventilated area; and
- Paints and adhesives should be avoided which give off dangerous solvent vapours. (Use water-based adhesives where possible.)

If these steps cannot be taken, then provide adequate ventilate (forced ventilation may be required), or mechanical extraction to ensure that fumes are expelled in a safe area free from potential sources of ignition.

Where the confined space itself may be dangerous (regardless of the work carried out):

- People who are required to work in or enter the space should receive training and instruction in the precautions to be taken inside the area.
- At least one person should be stationed outside the space to keep watch and communicate with anyone inside.
- Rescue procedures should be included in the training of workers. Reliance should never be placed on one person alone to lift injured or unconscious people out of a confined space during rescue, unless they are equipped with special lifting appliances. Rescue equipment, including emergency breathing apparatus, should be available near the entrance at all times.
- No attempt should ever be made to clear fumes or gases with pure oxygen.

- Appropriate respiratory protection shall be provided where the results of monitoring assessment indicates that a safe atmosphere cannot be established.

9.9 DEMOLITION

Demolition is extremely hazardous work. Where inappropriate work methods have been or are adopted, the lives of employees and other people in the vicinity are placed at risk.

Contractors or employers who carry out demolition work or contract others to should take all practicable steps to ensure:

- The public are protected from the rubble, dust and traffic by proper gantries and fenced walkways.
- Power, gas, telecommunications, sewerage and water services have been disconnected.
- Walls are never left free-standing that could be blown down by unexpected winds.
- Where any wall is to be toppled by pulling, there is a surrounding clear space of 1.5 x wall height.
- Floors are not overloaded with demolition debris or plant being loaded on to floors. (Loadings should be checked by a competent engineer.)
- Adequate measures are taken to overcome asbestos hazards from old insulation and construction materials.
- Empty tanks are checked for explosive or toxic materials
- Professional advice is taken before tackling prestressed concrete structures.
- Noise is controlled at the source.
- Protective helmets, also eye, feet and hearing protection is provided and it is ensured that it is used.
- Precautions are taken to avoid fire in debris.
- The public is protected from the site.
- When chainsaws are used, protection is provided for the user's legs, eyes and ears.
- Traffic crossing footpaths is controlled by adequately trained personnel.
- Access is prevented to any person once any controlled collapse demolition process has started.
- All mobile mechanical plant has been fitted with an appropriate falling object protective structure.
- Additional support is provided for employees required to remove brittle roofing.

