CIVIL CONSTRUCTION

SAFETY MANUAL

FIRST EDITION FEBRUARY 1991

Workplace Health and Safety

Inside the rear cover of this book you will find the booklet:

FIRST AID HINTS

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State Health Building
147-163 Charlotte Street
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(This booklet is not available on Computer printout)

PREFACE

Employers and principal contractors have a duty of care under Sections 9, 10 and 11 of the Workplace Health and Safety Act to ensure the health and safety of themselves, their employees and any other persons (non-employees) at the workplace. ADDITIONAL **duties are placed on principal contractors** by **Section 23 of the** *Workplace Health and Safety Act,* i.e. these duties are in addition to, and not in substitution of, their duties under Sections 9, 10 and 11 of the Act. (Refer to Section 15 of the Act). This duty of care cannot be delegated, but may also be held by any employee operating under the authority of an employer or principal contractor.

Employees also have duties under of the *Workplace Health and Safety Act.* Section 13 requires that they do not act in a manner that endangers the health and safety of themselves or any other person.

The number and severity of injuries in the civil construction industry have raised serious concerns about the performance of these duties by employers, principal contractors and employees. From 1 July 1987 to date, there have been 944 workers compensation claims lodged in this industry. Total payments by the time these claims have been finalised, are estimated at close to $10 million. In addition, the industry will have borne indirect, uninsured costs in the order of $40 million.
Over-exertion, falls, stepping on objects and being struck by objects were the most common cause of compensation claims in the civil construction industry. The severity of these injuries varies, though the most costly causes of injury, in terms of compensation paid, are:

- being struck by vehicles or machinery, i.e. through collision or rollover;
- body stress and strain (e.g. back pain) from the handling of objects;
- falls from vehicles, equipment, scaffolding, ladders or elevated surfaces;
- slips and falls on work surfaces, over obstacles or into trenches or ditches;
- being struck by falling objects; and
- trenches caring in or collapsing.

The construction industry has the third highest number of industrial fatalities, exceeded only by **the agricultural and transport industries.** Vehicle accidents are the most common cause of fatalities in the construction industry, while falls are the second most common cause of fatalities.

This Safety Manual is intended to assist in reducing the number and severity of injuries in the civil construction industry. It contains requirements under the *Workplace Health and Safety Act* and other State legislative requirements, as well as good industry practices.

The assistance of the Australian Federation of Construction Contractors and the Department of Transport in the development of this Safety Manual is gratefully acknowledged.

1. SCOPE AND GENERAL

1.1 Scope

This manual applies to health and safety procedures in the Civil Construction Industry.

1.2 Application

This manual should be read in conjunction with the Acts, Regulations, Codes of Practice, Standards and Manuals listed in Appendix 1.

1.3 Major Legislative Requirements

Where a method of work has been prescribed by the legislation, an employer or principal contractor shall carry out the work as prescribed OR seek approval from the Director of Workplace Health and Safety for an alternative method. (Refer Section 136 of the *Workplace Health and Safety Act).*

Fully documented details of the method of work (whether the prescribed or approved method of work) shall be prepared by the employer or principal contractor or a person nominated by them. This documentation shall be retained on the project.

Where, due to special project circumstances, all or part of this manual is not applicable, the employer or principal contractor should determine safe alternative methods of work. These alternative methods of work should then be documented and the documentation retained on the project. Any alternative methods should not conflict with the requirements of the *Workplace Health and Safety Act and Regulations.*

Under Section 27 of the *Workplace Health and Safety Act* every employer and principal contractor:-

- shall keep a record in the prescribed form showing the particulars in respect of every work injury, work-related illness or dangerous occurrence that occurs at a workplace;
- shall insert the particulars of that work injury, work-related illness or dangerous occurrence not later than three clear days after its occurrence;
- shall make that record available for inspection when requested to do so by an inspector.

Section 28 of the *Workplace Health and Safety Act* requires that where any serious bodily injury, work-related illness or dangerous occurrence occurs on or in relation to a project, notice shall be given by the principal contractor to the Director in the prescribed form. This notice shall be given within 24 hours of the occurrence of a serious bodily injury or dangerous occurrence, or within 24 hours of becoming aware of a work-related illness.

Form 7--RECORD OF INJURY, ILLNESS AND OCCURRENCE and Form 2--NOTIFICATION OF SERIOUS BODILY INJURY, WORK-RELATED ILLNESS OR DANGEROUS OCCURRENCE are contained in Appendix 2. Supplies of these forms are available from any Workplace Health and Safety office.

1.4 Definitions

To assist in using this Manual, some definitions are given below. Generally, these are the same as those in the *Workplace Health and Safety Act and Regulations.*

"Approved" means approved by the Director, Workplace Health and Safety. In some instances this approval may be delegated to Inspectors of Workplace Health and Safety;

"Australian Standard (A.S.)" means a standard, rule, code or specification of the Standards Association of Australia;

"British Standard (B.S.}' means a standard, rule, code or specification of the British Standards Institution;

"Competent person" means a person who by reason of qualifications and experience has the skills necessary to perform duties under these regulations in respect to which the expression is used and who has been appointed by the employer, principal contractor or owner to perform those duties.

"Director" means the Director of Workplace Health and Safety, appointed under the provisions of the Workplace Health Safety Act.

"*Employee*" means a person who performs work for an employer;

"Employer" includes a person who, in the course of his business, engages the services of another person in the performance of any work: the term includes a self-employed person;

"Health and Safety Officer" means the person nominated by the principal contractor to carry out the duties of the Health and Safety Officer; the term may include a workplace health and safety officer appointed under the provisions of the *Workplace Health and Safety Act;*

"Inspector" means any person who holds an appointment as such within Workplace Health and Safety;

"Mobile Plant" means any earthmoving, road making, tree felling or other mobile machine. This term does not include items of plant which are mobile for transport between projects, but operate in a fixed mode on the project, e.g. stone crushing units.

"*Non-employee*" means a person reasonably at a workplace or project who is not an employee of the principal contractor or the person in control of the workplace. Examples are: design engineers, delivery truck drivers, members of the general public.

"Notified project" means a project with a value above the level for notification prescribed by the Workplace Health and Safety Regulations or a class of project defined by the Director (usually because of unusual risks);

"Person in control of a workplace" means either the employer or principal contractor and for the purposes of some offences under the Act can include a representative of the employer or principal contractor in control of a workplace used by employees and non-employees.

"Personal Protective Equipment" means clothing or equipment which, when worn or used correctly, protects part or all of the body from identified risks of injury or disease in the workplace. The term includes: protective footwear, headwear, gloves, hearing protection, high visibility safety garments, respiratory protective equipment, thermal underwear, etc. **NOTE**: Personal protective equipment will be referred to throughout this manual as PPE

"Principal Contractor" used in ;relation to a project, means the person who, pursuant to Section 18 of the *Workplace Health and Safety Act,* is the principal contractor in respect of a project;

"Project" means subject to Section 17 (2) of the *Workplace Health and Safety Act* -

(a) the construction, digging, filling, erection, installation, addition to, alteration, repair, maintenance, cleaning, painting, renewal, removal dismantling or demolition of a building or structure;

(b) any work, or any work of a kind or class, designated by the Director, pursuant to the provisions of the Workplace Health and Safety Act to be a project.

"Retroreflective" means where a light ray is returned in a narrow band back to its source, i.e. in the direction from which it came;

"Scaffolder" means a person who is responsible for the erection or dismantling of scaffolding, which is any structure, staging or platform set up or used for or in connection with the performance of work, or for or in connection with the support or protection of people engaged in work: Scaffolding includes the materials used in the erection of such a structure, staging or platform and includes falsework exceeding 4,5 m in height;

"Specified work" means any work where the conduct of the work is specifically covered by the Workplace Health and Safety Regulations, e.g. excavations, trenches, tunnels, construction, alteration and removal of buildings, confined spaces etc.

2. TRAINING AND CERTIFICATION

2.1 Basic Safety Induction

Under Regulation 13 of the *Workplace Health and Safety Regulations 1989,* the employer or principal contractor shall ensure employees have received instruction in workplace health and safety issues BEFORE employees start work on a notifiable project.

Instruction should be supported by a Safety Handbook distributed to all persons being trained. Each book should contain a form which is to be completed by the employee, giving personal details and confirming that the employee has understood and is willing to obey the subject matter of the safety book. This form should be kept by the employer or principal contractor. For future employment purposes, the employee should also be given a certificate regarding the date and nature of the induction training undertaken.

Certain topics should be covered in the training, provided they are relevant to the work being performed. These include:

- use and care of personal protective equipment, e.g. helmets, boots, etc
- safety procedures for mobile plant
- prescribed occupations, e.g. plant operators, scaffolders, riggers, etc
- use and location of general safety equipment, e.g. rescue equipment
- use of equipment, e.g. ladders, saws, compressed air, etc
- fire fighting procedures and equipment
- correct manual handling
- housekeeping and cleanliness
- the banning of alcohol and drug affected persons from the workplace

The following information should be easily available to employees, particularly those employees new to the site:

- the identity of the Health and Safety Officer
- the identity of the Health and Safety Representative(s)
- the identity and location of First Aid Officers
- the identity and location of the Occupational First Aid Nurse
- the location of the first aid post
- emergency telephone numbers
- emergency procedures
- hazardous areas on the site
- procedures for issuing personal protective equipment
- the location of the toilets
- the location of the workplace health and safety notice board
- administrative procedures of the workplace

Apart from instruction and training for employees, employers or principal contractors should also determine how to protect the health and safety of non-employees, e.g. delivery drivers, members of the general public, on the site.

2.2 Specific Safety Induction

When an employee is required to perform a particular task that has hazards associated with it, and these hazards have not been covered in previous Safety Induction courses, the employer or principal contractor shall ensure the employee is given specific safety induction to protect them from these hazards.

Employees should clearly understand the nature of any hazard experienced and controls put into place to eliminate or minimise hazards. Where PPE is provided, training and instruction should be given to ensure employees under-stand how to use the personal protective equipment correctly. With some items of personal protective equipment, e.g. safety harnesses, improper use can cause injury or death. Some items also need to be fitted to the wearer to ensure that the necessary level of protection is provided, e.g. eye protection, protective footwear, etc.

2.3 Certificates of Competency

The following occupations require the operator or user to hold a certificate of competency, permit or authority to operate, applicable to the item being operated or used:

(a) Crane Chaser
(b) Crane Operator
(c) Demolisher
(d) Dogman
(e) Explosive-Powered Tool Operator
(f) Machinery Operator
(g) Plant Operator
(h) Rigger
(i) Scaffolder
(j) Welder.

NOTE:
Crane Chaser (exemption)--A person may carry out those duties usually performed by a crane chaser without any qualifications, where the load is at all times accessible to the crane operator and is less than 10 metres from the crane operating position.

Scaffolder (exemption)--A person may erect scaffolding without any qualifications where a person is not able or not likely to fall more than 4.5 metres from the working platform of the scaffolding.

Welder -Welding certification is only required where it is called up in the regulations or the relevant Australian Standard, e.g. welding on pressure equipment requires successful completion of a welding procedure qualification test and certification in accordance with A.S. 1796--SAA Welder Certification Code. Successful completion of the procedure qualification test is required for most welding of structural load bearing components on cranes, hoists and lifting devices. Other welding can generally be done with neither certification nor successful completion of the procedure qualification test, e.g. tack welding.

The operator of mobile plant should hold the relevant endorsement on their certificate before mobile plant is used in the crane mode. Under the employer or principal contractor's duty of care, the mobile plant may need modifications to be safely used in the crane mode.

The full requirements with respect to each listed occupation are set out in Part V (Certificates, Permits and Authorities) of the *Workplace Health and Safety Regulations.* Appendix 3 provides requirements for Certificates of Competency relevant to the Civil Construction Industry.

It is the employer's and principal contractor's responsibility to ensure that:

(a) work is only performed, and
(b) a person is only employed to perform work in a prescribed occupation when the person performing the work is a holder of a current certificate of competency, a permit or an authority to operate, issued by the Director.

Further, any person other than the Director of Workplace Health and Safety, is prohibited from directing the holder of a certificate of competency to perform any acts contrary to any provision of the *Workplace Health and Safety Act and Regulations.*

2.4 Production of Certificates

Any holder of a certificate of competency, permit or authority to operate, may be required to produce that document to any inspector, principal contractor or employer on request. Failure to comply with a request from an inspector is an offence under the *Workplace Health and Safety Act.*

2.5 Operator Instruction

Before an operator performs any allocated task, e.g. rolling, grading, or reversing trucks, the employer shall ensure the operator has been adequately instructed in:

(a) procedures used in safely performing that task; and
(b) hazards that may occur during performance of that task.

Furthermore, the employer shall ensure the operator is aware of the duties as specified in *Regulation* 134 of the *Workplace Health and Safety Regulations,* relevant to the plant being operated.

2.6 Working Under the Influence

The principal contractor or employer has a duty to ensure the health and safety of employees and any other persons at the workplace. This includes the health and safety of any alcohol or drug affected person. The following rules should be implemented:

(a) The use or consumption of drugs of abuse or alcohol at the workplace is not permitted.
(b) Persons affected by them are not allowed at the workplace.

Any person who places the health and safety of any person at the workplace at risk, i.e. by being affected by alcohol or drugs while at the workplace, commits an offence under Section 13 of the *Civil*

3. TRAFFIC AND ROAD DESIGN SAFETY

3.1 Rules

Where the public travels through or adjacent to a project, all traffic including construction traffic using these thoroughfares shall comply with the rules specified in the *Traffic Act 1949-1985.*

Within the boundaries of a project, excluding public thoroughfares, the employer shall be responsible for the formulation of a Method of Work Plan.

This Method of Work Plan shall include, but not be limited to:

- Traffic movement
- Operation of haul roads
- Access to the site

A copy of the plan should be accessible to all employees, e.g. on the crib hut wall.

In a situation where the Work Plan Traffic Rules are different from the rules outlined in the *Traffic Act 1949-1985,* a clear demarcation point should be made. This point of transfer from one set of rules to the other should be clearly marked with signs so that drivers passing this demarcation point are clearly reminded that the rules have changed.

Where projects are constructed under traffic, vehicle drivers should be advised to follow directions given by traffic controllers or traffic control devices. Drivers and passengers should remain in their vehicles while travelling through the project.

3.2 Signs

All signs shall meet the requirements of the "Department of Transport Manual of Uniform Traffic Control Devices". This is available from:

The Receiving Officer
Goods Reception Area Floor B3
Department of Transport Building Boundary St, SPRING HILL 4000.
Phone (07) 834 2011

3.3 Roads

Project roads and haul roads shall be designed to ensure the safe passage of all persons using the road. If a hazardous section cannot be removed from a project or haul road, authorised personnel using this road shall receive instruction on the operational rules used when travelling through the hazardous section.

NOTE: An authorised person is a person who has permission from the principal contractor or owner to proceed through an area.

Permanent roads shall be designed in such a manner that adverse safety conditions are minimised during construction. Procedures should be instituted to ensure that members of the public are either excluded from the workplace, or alternatively, thoroughfares are not left in a hazardous state when work on the project has ceased, e.g. weekends.

3.4 Pedestrian Traffic

Special attention should be given to pedestrian safety when the normal pedestrian routes are closed or obstructed. Detours from footpaths to sidetracks or walkways should be clearly defined and kept clear of any obstructions. Barricades should be erected to protect the public from entering hazardous areas of the work site. It is important that all walkways be kept clean and free from rocks and debris, and that walking surfaces are not slippery from mud, oil spillage, etc.

Barricades for the control of pedestrian traffic are self supporting fences consisting of vertical and horizontal members. The top of a barricade shall be at least 900mm high and no more than one (1) metre in height, throughout its length. A barricade should be made of timber, steel or of a design and material registered with Workplace Health and Safety for use on a project. A barricade is only a temporary measure for protecting the public. Once it ceases to be adequate for such purposes it shall be replaced or changed to provide an adequate level of protection.

Where temporary barricades are required to be erected parallel to the edge of a road, there is a risk that horizontal members may become airborne when struck by a vehicle. Therefore using an alternative type barricade, e.g. high visibility mesh, should be considered.

Guard rails should be supplied and erected to the appropriate Australian Standards where substantial barriers are required to separate pedestrians and traffic.

4. HAZARDS

DO ANY OF THE FOLLOWING OPERATIONS OCCUR ON YOUR SITE?
NOTE: The following are set out in alphabetical order.

- Abrasive blasting
- Asbestos removal
- Blasting operations
- Bridge stressing
- Cockerall working
- Demolition work
- Grade checking
- Hot bitumen working
- Line marking·
- Laser operations
- Loading and unloading trucks
- Nuclear Densometer operations
- Operations involving exposure to noisy plant or a noisy working environment
- Operations incurring vibration
- Operations involving constant repetitive movements
- Operation of plant
- Pile driving
- Post tensioning and prestressing operations
- Protruding objects, e.g. reinforcing starter bars, conduits
- Screed hands
- Servicing and fuelling of plant
- Spotting
- Stick picking
- Underwater diving
- Use of explosive-powered tools
- Welding operations
- Working at heights
- Working in areas where handrails are needed
- Working in confined spaces
- Working near overhead power lines
- Working on or near structures
- Working under, over or near traffic
- Working with crushers or pugmills
- Working with or near compressed air and equipment
- Working with or near hazardous substances
- Working with or near plant
- Work involving the storage of flammable and combustible liquids
- Work involving the use of ladders
- Work which may disturb underground services, e.g. gas, power, water

THE REQUIREMENTS FOR CONTROLLING SOME OF THE HAZARDS CONTAINED WITHIN THESE OPERATIONS ARE SET OUT BELOW. READ ON CAREFULLY.

4.1 Confined Spaces

All conditions, precautions, etc, as outlined in A.S.2865--Safe working in a confined space, shall be complied with when working in confined spaces, e.g. tunnels, compressed air work in caissons, tanks.

4.2 Demolition Work

Unless otherwise approved, demolition work shall be carried out in accordance with AS2601--The demolition of structures. Particular attention should be given to Pan XII of the *Workplace Health and Safety Regulations*--Demolition Work. This gives specific information on:

- the zone of demolition;
- inspections;
- Certificates of Competency;

- the notification required in certain circumstances; and,
- special requirements for asbestos removal

4.3 Explosive-Powered Tools and Air Nailing Tools

Due to the hazardous nature of explosive-powered tools (EPTs), only persons holding an EPT Certificate are allowed to use explosive-powered tools. *Regulations* 96 and 97 of the *Workplace Health and Safety Regulations* cover EPTs and air nailing tools.

4.4 Explosives

Transportation, storage and use of explosives shall be in accordance with the *Explosives Act 1952-1981.* For further information contact the Department of Resource Industries.

4.5 Hazardous Substances

Hazardous substances shall be handled in the workplace according to *Regulations* 265 to 287 of the *Workplace Health and Safety Regulations.* "Hazardous Substances" means those substances and items specified in Section 2 of the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code) or classified as dangerous goods using the classification criteria of the ADG Code. This ADG Code has been published in the Commonwealth of Australia Gazette and is set out in *Regulation* 265.

Under *Regulation* 275 of the *Workplace Health and Safety Regulations,* manufacturers and suppliers shall provide Material Safety Data Sheets (MSDSs) for hazardous substances stored or handled at a workplace. These MSDSs shall be provided with the initial supply of any hazardous product, and on request.

In order to fulfil their responsibilities for the health and safety of their employees, employers and principal contractors shall ensure that MSDSs for all hazardous substances stored or handled at the workplace are obtained and are readily available to all employees. When a hazardous substance is first introduced into the workplace the employer or principal contractor shall advise all employees of the safety requirements for that hazardous substance.

MSDSs provide information that enables hazardous substances to be safely handled in the workplace. Information given by MSDSs include:

- the identity of the hazardous substance;
- physical and chemical properties of the substance;
- uses of the substance;
- health hazards created by the use or storage of the substance; and,
- safe handling and precautions for use.

4.6 Lasers

Use of a laser or a laser product shall be in accordance with:

i) *Regulation 91* of the *Workplace Health and Safety Regulations;*
ii) A.S. 2211--Code of practice for laser safety; and
iii) A.S. 2397--Guide to the safe use of lasers in the construction industry

4.7 Manual Handling

Manual handling means any activity requiring the use of force exerted by a person to lift, lower, push, pull, carry or otherwise move, hold or restrain any animate or inanimate object. These activities may stress or strain the body when the force required exceeds the capacity of a person to safely provide or the activity is improperly undertaken. The risks from manual handling should be assessed and reduced at the workplace.

Construction sites by their nature are constantly changing. As the project takes shape the physical characteristics and nature of risks changes dramatically. This creates a great deal of difficulty when it comes to redesigning work systems and work tasks. Nevertheless, a number of general principles apply. If employees are educated about how to reduce exposure to risk, and the company is committed to risk reduction, effective changes can be made. The Code of Practice for Manual Handling recently adopted by Queensland has information to assist employers in meeting their duty of care in this respect.

Generally the following principles apply:-

- use smooth, controlled actions and movements

- avoid repetitive bending, twisting and overreaching movements
- design the workplace and work station layout to allow employees to use an upright and forward facing posture, to have good visibility of the task and to perform the majority of tasks at about waist height and within easy reach
- decrease the frequency, repetition and duration of the manual handling activity where practicable
- store frequently used items between knuckle and shoulder height
- when carrying a load keep it as close as possible to the body
- for seated work, avoid lifting, lowering or carrying loads above 4.5 kg
- avoid lifting, lowering or carrying loads above 20 kg, where practicable
- never lift, lower or carry loads above 55 kg without mechanical or other assistance
- persons under the age of 18 should never lift, lower or carry loads in excess of 20 kg without mechanical or other assistance
- extra care should be taken when lifting, lowering or carrying awkward, large, unbalanced, slippery, soft, hot, cold or sharp-edged loads
- poor housekeeping, inadequate lighting, lack of space, poor walking surfaces, uncomfortable working temperatures, lack of training in manual handling techniques, young or old age and ill-fitting clothing all increase manual handling risks

Manual handling risks can be controlled by:-

- job redesign--changing the weight, size or shape of the load
  --changing or rearranging the workplace layout
  --rearranging the materials flow
  --using different actions, movements and forces to do the task
  --modifying the task through mechanical assistance or team lifting
- mechanical handling assistance--providing mechanical handling equipment and appropriate training to use the equipment
- training--where the previous control options don't reduce the manual handling risk than appropriate instruction, training and/or education should be provided

4.8 Nuclear Densometers

Licences are required for using, storing or transporting a Nuclear Densometer. These are available from Health & Medical Physics, Department of Health.

Use of these devices is subject to stringent procedures as outlined by the Department of Transport's *Nuclear Testing Manual--Safe Working Practice (Part 6).* This Manual is essential reading where a Nuclear Densometer will be used by an employee. The Manual may be obtained from:

The Materials Branch Department of Transport
35 Butterfield Street HERSTON 4006
Phone (07) 834 3000

4.9 Occupational Diving

Safety precautions, training and working procedures relating to diving shall be in accordance with *Regulation* 259 of the *Workplace Health and Safety Regulations.* A particular duty of employers and principal contractors is that a person shall not be employed or instructed to work as a diver or carry out a dive, unless that person:

(i) Has been certified as medically fit to dive in accordance with A.S. 2299-- Occupational Diving;
(ii) Has practical experience and training in accordance with the appropriate part of A.S. 2815--Training and Certification of Divers;
and
(iii) Possesses a certificate issued by the relevant statutory authority which indicates that training has been successfully completed in accordance with the requirements of A.S. 2815--Training and Certification of Divers.

More information on occupational diving is available in Appendix 4.

4.10 Overhead Power Lines

Work shall not be undertaken less than 4.5 metres from an overhead power line unless approval has already been obtained by the local electricity authority.

(i) For work within the specified distance a person shall be designated as a safety observer.

This safety observer-

- shall have a sound knowledge of the work being performed and of the safe working practices applying to that work;
- shall not perform any other work during the period they act as a safety observer; and
- shall stop any work which they consider may cause any person on the site to suffer an electric shock, and shall report this stoppage to the person in charge of the work.

(ii) Any overhead line shall be considered energised unless it is disconnected and physically grounded.

4.11 Slips, Trips and Falls

Slips, trips and falls are a very simple way in which serious injuries have occurred in the workplace. Almost all of the vertebral fractures which occur on construction sites are the result of falls. Modifying the work environment is the most effective way of reducing the risk of falls. Unfortunately, constantly changing workplaces in the construction industry make it difficult to prevent falls.

The risk of slips, trips and falls may be reduced by--

1. Keeping all pedestrian areas reasonably free of tripping hazards.
2. Where practicable, ensuring all pedestrian surfaces are non-slip or that appropriate footwear is worn.
3. Ensuring the edges of walkways, stairs, etc. are clearly visible to pedestrians.
4. Providing hand rails on walkways, stairs, etc. These are particularly needed when accessing machinery.
5. Complying with all trenching regulations, e.g. providing barricades around excavations or trenches where a person may fall a distance of one (1) metre or more.
6. Complying with all scaffolding regulations, e.g. erecting scaffolding where a person may fall 4.5m or more from a working platform.
7. Providing adequate hand and foot holds for access to vehicles or machinery. This can be done by the principle contractor or employer, or requested in design specifications to the manufacturer.
8. Ensuring that all ladders are well-maintained and used correctly, particularly with respect to surface anchoring.
9. Ensuring clear paths and good visibility where tandem carrying of goods, materials, etc. is necessary.
10. Using safety harnesses and safety belts where a person may fall 2.4m or more and it is not practicable to provide guardrails, midrails or edge protection.

4.12 Vibration

Whole body vibration (WBV) occurs when vibration is transmitted to a person through some supporting structure, such as a vehicle seat in mobile plant. WBV stresses the entire body, and particularly affects the back. Early symptoms of stiffness or pain may occur in the neck and back. Long term exposure may damage intervertebral discs and cause fractures of the vertebrae.

Employers and principal contractors should ensure that all practicable action is taken to reduce whole body vibration. This **includes** giving feedback to manufacturers about the performance of machinery with respect to vibration.

Localised vibration occurs when vibration is limited to a specific body part, such as the hands. Pneumatic tools are the main source of localised vibration. Personal protective equipment (gloves) are available which reduce the amount of vibration transmitted to the hands of persons operating pneumatic impact tools. These gloves absorb the vibration and dissipate it throughout the whole glove, thereby reducing vibration to the operator's hands.

The exposure of employees to vibration should be eliminated or reduced whenever possible. Control measures include--

1. Assessing the vibration levels of plant before purchase. Plant offering the minimum level of vibration should be selected.
2. Modifying the ground over which mobile plant or vehicles travel, or where possible, avoiding ground which increases vibration levels.
3. Maintaining equipment in good order.
4. Modifying equipment to eliminate exposure, e.g. moving controls off the vibrating surface, mechanically isolating the source of vibration, using passive anti-vibration seats.
5. Changing work practices to eliminate exposure, e.g. rotating jobs and multi-skilling to

reduce exposure to individuals.

4.13 Welding

The process of welding, riveting or cutting at a workplace shall be performed in accordance with:

(a) A.S. 1558--Protective clothing for welders
(b) A.S. 1674--Fire precautions in cutting, heating and welding operations
(c) A.S. 1796--SAA Welder certification code and
(d) A.S. 2745--Electrical welding safety

Regulations 45, 236 and 237 in the *Workplace Health and Safety Regulations* relate to welding operations.

4.14 Work in Compressed Air

Safety precautions and working procedures relating to work in compressed air (other than diving), shall be in accordance with A.S. CA12--Rules for work in compressed air.

5. MOBILE PLANT OPERATIONS AND REQUIREMENTS

5.1 Roll Over Protective Structures (ROPS)

As an industry standard, the **Engineering Construction Industry Workplace** Health and Safety Committee has recommended that:

For Plant Purchased after 1 January 1991. All new mobile plant (except for road trucks, paving machines and hydraulic excavators) which requires the operator to be positioned upon the machine to operate it, shall be fitted with Roll Over Protective Structures (ROPS) and seat belts if purchased new.

All ROPS shall meet the requirements of A.S. 2294--Protective structures for operators of earthmoving machines, and seat belts shall meet the requirements of A.S. 2664--Earthmoving machinery--seat belts and seat belt anchorages.

For Plant Owned and in use or able to be used after 1 January 1993 for the Purposes of Civil Construction. After 1 January 1993, all existing mobile plant used in civil construction or able to be used in civil construction (except for road trucks, paving machines and hydraulic excavators) which require the operator to be positioned upon the machine to operate it, shall be fitted with ROPS and seat belts.

All ROPS shall be certified and comply with A.S. 2294--Protective structures for operators of earthmoving machines, where such ROPS are readily available. An owner may fit a ROPS which is designed by a competent person. The manufacture and fitting of the structure shall be performed by a suitably qualified tradesman. Seat belts shall comply with A.S. 2664--Earthmoving machinery--seat belts and seat belt anchorages.

5.2 Plant Maintenance

Plant and plant parts, e.g. tyres, shall be maintained at a standard which keeps the plant in good working order during operation. There should be a reporting system for parts breakdown to ensure prompt repair. As well, log books should be kept for all plant. These log books should be used to record all significant repairs undertaken on that item of plant, and this log book should be updated as repairs are undertaken.

5.3 Plant Operation

Mobile plant shall be operated at all times in a safe manner. Particular attention should be paid to vehicle speed in relation to site conditions, e.g. slow speeds for congested sites. Seat belts, when fitted, shall be worn at all times unless the wearing of the belts endangers the operator or others, e.g. by restricting movement or vision

5.4 Tandem Riding

Under the employer or principal contractor's safety procedures, only the operator or other authorised persons are permitted to ride on mobile plant, or access any fixed plant items. Persons shall only be given authority to ride on plant with the operator for specific purposes, e.g. training or fault finding.

5.5 Truck Operators

Truck operators are responsible for giving load placement requirements to crane operators before loading operations begin. The load should be placed so that it will remain stable during loading, unloading and travelling.

Rear Dump or Tipper Trucks. Truck operators, including tandem riders or passengers during loading operations, shall remain either:

(a) Totally within the cab of the truck, or

(b) At a distance from the truck so that falling rocks and other debris cannot come into contact with them. Persons shall only approach the truck after the loading operation is completed and the load has been placed in a stable position, i.e. with no risk of more debris falling while the truck is stationary.

5.6 Reversing

All mobile plant shall be fitted with an operating audible and visible reversing signal. The signal shall

be audible for at least seven seconds after reversing starts and shall remain visible during the reversing procedure. If the reversing procedure takes less than seven seconds, the signal shall be audible throughout the reversing procedure.

5.7 Parking

Mobile plant shall be secured against rolling or any other movement, with blades, buckets or other implements lowered to the ground when parked.

5.8 Motor-Powered Mobile Work Platforms

All motor-powered mobile work platforms or elevating platforms shall be used in accordance with A.S. 1418--Cranes (including hoists and winches), Part 10--Elevating work platforms.

5.9 Recommended Procedures for Plant Operation

Operators and persons-in-charge, i.e. supervisors, etc. should pay particular attention to the following procedures. These are recommended during normal operating conditions, i.e. non-emergency situations:

GENERAL

Before Starting

- Know the hand signals used on site.
- Read and understand all warning signs in the cab.
- Walk around the machine before mounting. Check for other people and safe clearance. Look for signs of fluid leaks, tyre, track or implement damage. Check mirrors, horn and lights and other safety devices.
- Keep the windscreen, windows and mirrors clean. Ensure windscreen wipers are in working order.
- Check fire extinguishers, if fitted.
- Inspect the machine for potential hazards. If a safety defect is found, the machine should be tagged as such.
- Mount and dismount the machine using the steps and grab handles. Use both hands and face the machine. Keep all deck plates, steps and handles in good repair and free of mud, grease and oil.
- Inspect the seat belt, mounting hardware and seat suspension. Adjust the seat and fasten the seat belt.
- Make certain that no one is working on, under or close to the machine.
- Check all fluid levels then move the transmission and implement controls into neutral and engage parking brake.

Plant Operation

- Only allow authorised persons to ride in or on equipment.
- Only get on or off a machine which is stationary. Never jump off a machine during normal operations.
- Ensure the machine is not overloaded.
- Move off slowly and check that the brakes are working properly. Also check that the steering is functioning correctly.
- Make certain that the area in the direction of travel is clear of people and obstructions. Use a spotter if necessary.
- Only travel at a speed safe in the circumstances, e.g. maintain a speed which is safe for the condition of the roadway, grade, clearance, visibility and traffic.
- Never reverse a machine into or out of a lineup. Leave adequate room to pull out or drive through.
- Only reverse a machine after you are sure there is no one behind the machine. If in doubt take time to be certain.
- Report any backup alarm which is not functioning correctly.
- Yield right of way to a loaded machine. If in doubt, yield right of way in any case.
- Make sure there is adequate clearance from power lines.
- Where practicable, avoid turning/working/travelling across a slope, as a sharp turn up or down a hill may cause rollover.
- When descending a grade use the same gear needed to climb it.
- Follow other machines at a safe distance.
- Stay a safe distance away from the edge of embankments.
- Only pass in an allowed location. Only pass when given right of way. Only pass when visibility is

clear.
- Only dig in an area after checking for the location of underground services.
- Fit and use rotating flashing amber warning lights as per requirements of the Traffic Act.
- Use lights after dark and in dusty or foggy conditions.

Shutting Down
- Secure the machine before dismounting. Set parking brake and lower attachments to the ground.
- Chock the wheels if the machine is to be left on an incline. Remove the machine's keys if these are used. When parking at the end of shift, leave room for service vehicles to pass.

TRUCKS

General
- Drive defensively. Obey road signs. Never race other vehicles. When following another vehicle, always allow enough distance to stop safely. One truck length for every 10 km per hour of truck speed should be the minimum distance between vehicles.
- Reversing is the most hazardous truck operation. Reversing alarms, which are fitted on some trucks, are effective in warning persons of the danger. Reverse trucks only when they are under the direction of a signalman or when satisfied that the way is clear and will remain clear.
- Be cautious of spillage from loaded units and any hazards the spillage might present to people on the ground and to the tyres of other plant.
- Trucks sometimes fall over a tip head because the driver backs over the edge or the edge collapses under the weight of the truck. Use a protective beam or timber baulk or back under the control of a signal man in order to avoid this happening. Where ground conditions are soft, or the tip head is likely to subside, dump loads back from the edge and have a dozer move the material over the edge.

Loading
- Never enter or leave the cab during loading.
- Watch for and avoid other vehicles, personnel and rock outcrops on entering or leaving the loading area. Stay a safe distance from trucks ahead at the loading point, and follow the directions of the signalman or loader operator before moving into the loading position. Move off when signalled that loading is complete.
- Load material, e.g. timber, so that it does not project beyond the truck body and present a hazard to other plant, people or structures. Where material is to be transported on a public road, Traffic Regulation No. 75 requires that material projecting either 1.2 metre or more beyond the front or rear of the vehicle, or 150 mm on either side, shall have a visible red flag or object fastened to the projecting end. Unusually wide or long loads require a permit from the Police Department.
- Secure loads at the lowest possible level on the tray with ropes or chains, and take special care when the truck is to travel over rough terrain. Cover up with tarpaulins or nets as appropriate.

Unloading
- Lower truck bodies before leaving the dump area.
- Only raise truck bodies to unload materials on surfaces where the vehicle will remain stable and upright.
- Never raise truck bodies to within a specified distance of overhead power lines unless approval has already been obtained from a local electrical authority (Refer Section 4.10 of this manual).
- Take special care when tipping a load or spreading screenings on a road. With the tray up, trucks are less stable and are more likely to roll over, particularly on hilly sections or roads with surface irregularities or steep shoulders. Check that the raised tray will not foul overhead power lines or telephone wires.

Transporting Personnel
- Trucks shall not be used to transport personnel unless they are specifically designed to do so.
- Where a bus is employed for the transportation of personnel, the bus shall: --
  - be enclosed;
  - have seats which are attached to the vehicle;
  -- have a safe means of access and exit; and,
  -- have two means of exit in case of emergency.
- Drivers transporting personnel should be alert, dependable and careful. Relevant safety rules include:
  - never allow passengers to ride with their arms outside the vehicle.
  - only start the vehicle after everyone is seated.

- persons should only get on or off the vehicle when it is stationary.
- tools, plant or gear should be stored in a compartment separate from passengers, i.e. compartments that are designed for storage and transportation and are separate from where personnel are seated. All items stored in this compartment should be secured against movement.
- ensure that exhaust fumes do not enter the passengers' compartment.

Towing

- When towing another vehicle, take the following precautions:
  - ensure the towing cable is undamaged and has a safe working load adequate for the job. Slings, straps or chains which are used for towing should not be used for lifting any gear or materials and should be identified as such, e.g. slings and chains, etc. should be tagged "not for use in hoisting operations".
  - before reversing, ensure everyone is clear. Get help from a signalman if the rear view is obstructed.
  - attach the towing cable securely to the machines at the points recommended by the manufacturer. If these are not known, ensure fixing points are selected that will not damage the tow cable or the
  - machine.
  - check what brakes are operational on the towed vehicle. There is unlikely to be any power assistance available for the brake system. Do not rely on parking brakes as a means of control.
  - when moving off, take up the slack carefully. Do not jerk the cable, and keep it taut to avoid damage.
  - keep towing speed down and as constant as possible.
  - keep clear of the area between the towing vehicle and the towed
  - vehicle.
  - attach a warning sign on the rear of the towed vehicle or machine
  - which reads "Vehicle Under Tow".

BULLDOZERS

General

- Be careful when working near the edge of banks, ditches, cuts or fills, or near overhanging material. The vibration and weight of the machine may cause the edge to give way or overhanging material to fall.
- Before starting work, ensure that an observer is present when plant is required to work in water where the depth may endanger the operator.
- Avoid obstacles such as rocks or logs. If forced to cross them, use extreme caution and change to the lowest gear. Ease up to the balance point and ease down to minimise the jolt on contact with the other side.
- When receiving a wire rope on a drum or through sheaves, operators should disengage the master clutch, idle the engine, and lock the brakes. NOTE: All operators should stop engines before working with ropes wound on front-mounted drums.

Clearing Operations

- When clearing trees, watch out for dead branches in tree tops.
- Dozer operators should make sure that all persons are standing clear before pushing over trees, dozing rocks or rolling logs. A long rope should be used to pull over large dead trees. (Make sure in advance that a falling tree will clear the machine and operator).
- In excavation work, operators should be alert to dangers from overhanging dirt and rocks. In such cases, dozers should be equipped with the relevant overhead protection.

Hill Travel and Work

- Wherever possible avoid travel across slopes. Drive straight up and down slopes. If the machine starts to slide sideways when working across a slope, turn the machine downhill and drop the blade.
- Keep a good bladeful of spoil in front of the blade when travelling down a steep slope. If spoil is being lost, lowering the blade slightly may help, though lowering it too far may cause overturning. NOTE: Dozer blades should not be used as a brake for going down a steep slope except in extreme emergencies.
- Dozer blades should be kept close to the ground for balance when the machine is travelling up a steep grade.
- When working on slip clearing, proceed with caution and watch the slope. Further falls may occur.

EXCAVATORS

General

- When excavating trenches, place the excavated material at a distance of one and a half times the depth of the trench from the edge of that trench. Where this is not practicable, place excavated materials at least one (1) metre from the edge of the trench.
- Ensure the ground beneath the machine is not undercut.
- Watch boom clearance when travelling. Uneven ground may cause the boom to weave and collide with obstructions.
- Avoid jerky slewing or sudden braking. These can make the machine unstable and overload machine components.
- Ensure the operator has the appropriate restricted operators licence if the excavator is to be used in the crane mode (Refer Appendix 5).
- When an excavator is used in the crane mode, check that the lifting weight is well within the approved lifting capacity for the machine. This lifting capacity shall be clearly and permanently marked on each machine.
- Only operate attachments while stationary, as operation during travelling may starve one of the track drive motors and result in an unintended turn.

Hill Travel and Work

- Create a level area to operate from when working on a steep grade. If you cannot do this, avoid swinging your boom downhill any further than necessary and operate your machine slowly to maintain stability.
- For uphill travel extend the boom and bucket forward. For downhill travel bring. the boom and bucket close in, in order to maximise stability and traction.
- Take care at the point of balance on the peak of a steep slope. Reduce speed and maintain stability until on level ground.
- Only turn slowly and widely when travelling up a steep slope or else the machine's stability may be threatened.

ROLLERS

General

- Follow all written safe work procedures to avoid overbalancing on the edge of a road or embankment formation. Examine edges for soft spots before starting work.
- Avoid gear changes on steep sections. Remember that a missed gear change may result in loss of control and the roller overturning. Hand or parking brakes should not be relied on to maintain control.
- Park on the fiat. If you need to park on a slope, chock the wheels.
- Look out for faster moving traffic.
- Look out for job personnel, e.g. soil testers, surveyors.
- Only climb onto or off a stationary roller.

Vibrating Rollers

- Single drum vibrating rollers should be driven in reverse when rolling along the edge of a fill.

Multi-tyred Rollers

- Machines should be either fully ballasted or completely empty to increase stability.
- When descending a steep grade the drive wheels should be leading
- When going up a steep grade the trailing end should be leading.
- The operator should be seated on the side which is closest to the edge of the fill. The roller should be travelling forward when rolling along the edge of a fill.
- Never allow a multi-tyre roller to travel along the edge of an embankment in reverse gear.

GRADERS

General

- When working on existing roads; place warning signs, watch out for any unexpected vehicles, and use all available plant hazard lights.
- Operators of motor graders should keep to the left side of a roadway. In cases where blading against traffic is necessary, extra precautions (flags, barricades, flashing lights, and flagman) should be used to alert traffic.

Hill Travel and Work

- When grading across a slope, avoid blade down-pressure and obstacles, as either can tip the machine. For maximum stability operate at low speed, lean the front tyres towards the uphill side, and cast material to the downhill side of the machine. ·Operate on as level a surface as possible when cutting high banks. With the blade raised, the grader is less stable than normal.
- Operators should be alert for rocks, logs, and trees when sloping banks. **NOTE**: Graders should be kept in gear at all times. They should never be permitted to coast downhill.

SCRAPERS

General

- Ensure that haul roads are to the required standard and a regular maintenance program is undertaken which keeps the running surface to the required standard.
- Inspect all haul road surfaces before plant starts work each day.
- Avoid back injury by keeping the seat suspension and seat belt properly adjusted and by engaging the cushion hitch.
- When stopping drop both the bowl and the cushion hitch.
- Keep hands and feet on the controls.
- Face in the direction of travel. If the operation of rear equipment needs watching use the rear vision mirror where practicable.
- When loading with the assistance of a push tractor, scraper operators should co-ordinate their efforts with the tractor operator.

Scraper Operation

- Know the traffic pattern of the haul. Even if the machine is loaded, always yield right of way to avoid a collision. Always assume that a water truck is loaded.
- Anticipate curves and grades and use the retarder and proper gear range to slow the machine.
- Avoid large obstacles, deep holes and soft edges.
- Carry the bowl as low as conditions permit. The lower the bowl, the more stable the machine.
- Be ready to drop the bowl in an emergency.
- Allow sufficient room for the trailer wheels when turning in a congested area.
- Never spin the wheels.
- Never pull in or out too sharply from the push dozer.
- Never run in the wheel ruts left by other machines.
- Never accelerate a twin power scraper's rear engine when entering a sharp turn, or the machine may jack-knife.

Hill Travel and Work

- When entering sharp turns, fill areas or downgrades, apply retarder and/or service brakes. Select the correct gear before travelling downhill. On long downgrades use the engine to assist braking. Avoid "fanning" the air brake pedal. Repeated light application of the brake may exhaust air pressure faster than the system is able to replenish it, leading to brake failure.
- When turning across a hillside, turn gradually. A sharp turn up or down the hill may cause rollover.
- When going downhill, operators should not "kick" their machines out of gear because increased speed may make control of the equipment difficult. Instead, machines should be left in gear and retarders used to control speed, with brakes used as a secondary speed control.

Towing

- When towing ensure that all personnel are standing clear before backing to couple-up. If a ground person is assisting, operators should not move the machine until signalled by the ground person. All equipment being towed should be secured by a safety chain in addition to the regular hitch or drawbar.
- Before any persons are allowed to couple the trailing equipment the towing vehicle should be stopped, the shift lever placed in neutral and the brakes set. Wheels of equipment being coupled should be chocked.
- When transporting a scraper between jobs, operators should use a scraper bowl safety latch or place a safety bolt in the push-beam to give maximum clearance.

FRONT END LOADERS

General

- Ensure the operator has the appropriate restricted crane operators licence if the loader is to be used in the crane mode (See Appendix 5).
- Ensure the hitching point on the bucket and the associated lifting gear are approved types when used in crane mode.
- Keep the travel speed slow enough to maintain complete control at all times.
- Don't cut corners. Slow down and leave enough clearance for the turn.
- Carry the bucket as low as possible to maximise visibility and to maintain stability. If the machine begins to tip drop the bucket.
- Carry the bucket with the teeth pointed up as close as possible to the vertical.
- Never use the machine for a man hoist.
- Never move loads over the heads of persons, truck cabs or any vehicle.
- Ensure that any equipment carried in the front bucket is properly secured from being accidently dislodged.
- When stockpiling material, carefully construct and consolidate the ramp at a grade easily handled by your machine.
- Lower the bucket to the ground before leaving the operator's seat.

Hill Travel and Work

- When working on slopes, where possible, work with the bucket facing uphill in order to maximise stability and avoid tipping.
- Where practicable, avoid turning/working/travelling across a slope, as a sharp turn up or down a hill may cause rollover.
- When descending a grade use the same gear range required to climb it.
- Never use the declutch brake pedal while descending a grade.
- When clearing road slips, take care that further slips or trees do not fall while moving material. Keep your eye on any material above the machine.

6. PERSONAL PROTECTIVE EQUIPMENT (PPE)

6.1 General

At present, there are a number of prescriptive requirements set out in Part VII of the *Workplace Health and Safety Regulations.* However, while these support duty of care obligations they do not cover all situations of risk of injury or death which can be prevented by the use of personal protective equipment. In addition, these regulations are under review and it is anticipated that they will be amended significantly by 1991.

Each employer or principal contractor needs to assess the risks of potential injury and disease to the whole body or parts thereof of their employees. Risks arise from general operations, e.g. crush injuries to the feet from rolling objects, as well as from systems failures, e.g. being sprayed by steam from a broken line. The current regulations are a guard against common injury situations. Where compliance with them may create secondary injury risks, e.g. falls from roofs because steel capped boots are worn, employers or principal contractors should ensure that these secondary injury risks are prevented.

In 1991 there will be available a Code of Practice on the Selection and Use of Personal Protective Equipment. This Code will help employers or principal contractors determine their requirements for PPE.

Where injury or disease risks are identified, measures to control these risks should be undertaken in the following order:-

Design-designing hazards out of machinery/equipment or workplaces and designing control measures in.

Substitution--replacing the equipment, material or process with a less hazardous one.

Separation--isolating the hazard from persons by enclosing or guarding

Redesign--redesigning equipment or work processes to reduce or eliminate risk.

Administration--adjusting the time or conditions of risk exposure.

Personal Protective Equipment--using appropriately designed and properly fit-ting equipment where the other controls are not practicable.

PPE is the last control measure chosen. Inspectors from Workplace Health and Safety may require an explanation from the employer or principal contractor on why PPE, rather than any of the other control measures, was selected.

6.2 Duties

The employer or principal contractor has the following duties with regards to PPE:--

- identifying which items of PPE shall be used.
- providing PPE items. Some PPE items may be covered by award conditions, e.g. boots, hats, and some by industry practice.
- ensuring PPE fits comfortably and offers the maximum protection.
- training and instruction in the correct use and maintenance of PPE.
- assessing whether secondary risks are created by wearing PPE. Where secondary risks are created, other control measures should be under-taken to eliminate or minimise these risks.
- providing signage to indicate areas where PPE shall be worn. · withdrawing defective items from use.

6.3 Some relevant items of PPE (in alphabetical order)

EYE PROTECTION

Eye protection shall be provided by the employer where there is a likelihood of injury to the eyes of an employee or other person. Eye protection shall be selected and used according to--

A.S. 1336--Recommended practices for eye protection in the industrial environment, and

A.S. 1338--Filters for eye protectors-Part l--Filters for protection against radiation generated in welding and allied operations.

HAND PROTECTION

Gloves shall be provided by the employer and worn by the employee where an employee or other person is required to handle material, tools, equipment, or substances which could harm the hands. These gloves shall be in accordance with A.S. 2161--Industrial safety gloves and mittens (excluding electrical and medical gloves).

Suitable protective substances shall be provided where an employee or other person is required to handle harmful substances or agents which could cause injury or irritation to the skin.

HEARING PROTECTION

The employer shall supply and the employee shall wear suitable hearing protection where an employee or other person is exposed to noise which is likely to be injurious to their welfare, and which cannot be suppressed at its source to an acceptable level. Hearing protection shall be in accordance with A.S. 1270--Acoustics-Hearing protectors.

HIGH VISIBILITY SAFETY GARMENTS

The employer or principal contractor shall provide high visibility safety garments to employees working in or adjacent to traffic. This includes traffic in quarries, construction haul roads and other areas where the wearing of high visibility safety garments will reduce the risk to the health and safety of an
employee. High visibility safety garments, e.g. red/orange and lime/yellow shall include the following materials:

- fluorescent materials for work during the day
- retroreflective material for work at night
- fluorescent and retroreflective materials for use during the day and night

High visibility safety garments which are designed to outline the human body, offer an increased degree of protection to the wearer, e.g. fluorescent and/ or retroreflective edging around the outside of the garment and strips on legs and arms are easily distinguished as being worn by people.

LIFE JACKETS AND RESCUE EQUIPMENT

Suitable life jackets and rescue equipment shall be provided by the employer and kept ready for immediate use where water exists on or adjacent to a project, into which an employee or other person may fall and either drown or be injured. Boats supplied for emergency use should be of adequate size to carry the anticipated loads safely, i.e. without the risk of capsizing.

PROTECTIVE FOOTWEAR

For most construction activities, steel capped safety boots complying with A.S. 2210--Safety footwear, will be needed to protect against crush injuries to the feet. However, in some situations, additional forms of protection against injury to the foot will be required, e.g. footwear which protects against water, chemicals, hot splashes, penetration injuries to the underside of the foot and ankle twist injuries from rough terrain.

PROTECTIVE HEADWEAR

Protective headwear ranges from industrial safety helmets for protection against crush injuries, to broad brimmed hats to protect against eye damage and skin cancer caused by exposure to the sun. Where both risks exist, i.e. falling objects and sun exposure, industrial safety helmets with brims should be worn. Industrial safety helmets to protect against crush injuries shall comply with A.S. 1800--The selection, care and use of industrial safety helmets

RESPIRATORY PROTECTIVE EQUIPMENT

Suitable respiratory equipment, protective clothing and ventilation shall be provided where any impurities (e.g. gas, vapour, dust, or other atmospheric contaminant) are present, cannot be suppressed at the source of emission, and are likely to be injurious to the health and welfare of an employee or other person, or are likely to produce an unsafe condition. Respiratory protection shall be in accordance with--

A.S. 1715--Selection, use and maintenance of respiratory protective devices, and

A.S. 1716--Respiratory protective devices.

SAFETY BELTS AND HARNESSES

The employer shall supply and the employee shall wear a safety belt or harness where an employee is required to work on any part of a site or structure and they cannot practicably be protected from the risk of falling by the provision of work platforms, guard rails, etc. Safety belts and harnesses shall be designed according to A.S. 1891--Industrial safety belts and harnesses. They shall be selected and used according to A.S.2626--Industrial safety belts and harnesses--Selection, use and maintenance.

7. CRANE AND MECHANICAL LIFTING OPERATION

7.1 Compliance

Cranes and their use shall comply with

Workplace Health and Safety Act 1989
Workplace Health & Safety Regulations
A.S. 1418--Cranes (including hoists and winches), and
A.S. 2550--Cranes-Mobile, tower and derrick-Selection and operation

Information on the safe operation of Tower Cranes is provided in the Tower Crane Information Book available from Workplace Health and Safety.

7.2 Operator Certification

Under *Regulation* 33, crane operators and crane chasers/dogmen are required to hold a certificate of competency or a permit or authority to operate before they perform prescribed work. It **is the employer or principal contractor's responsibility to ensure that only crane chasers/dogmen and crane operators with these documents are allowed to perform prescribed work with cranes.**

7.3 Load Indicators

Where required, all load indicators shall be fitted in accordance with A.S. 1418--Cranes (including hoists and winches), Part 4--Tower Cranes and Part 5--Mobile and vehicle loading cranes.

7.4 Notification

An owner, unless otherwise approved, shall notify the Director of any fabrication, installation, alteration or repair of a crane, before starting work.

7.5 Lifting Equipment

All lifting equipment shall be designed, manufactured, marked, stored and used in accordance with the relevant standard.

7.6 Lift Boxes

Lift boxes used for lifting persons or materials shall be of a type specifically designed for that purpose and such design shall be registered with the Director. The Design Registration Number and the lift box capacity, e.g. working load limit, shall be clearly marked and remain clearly visible on the box during its working life. Once a lift box design has been registered by the Director, the design may be used for the manufacture of more than one lift box.

7.7 Operational Requirements

(a) Rated load capacity charts, recommended operating speeds, special hazard warnings and other essential information shall be clearly posted in all cranes and hoists, and on other relevant equipment. Follow these directions at all times:
- Never attempt to lift more than the rated capacity of the machine or its rigging.
- The capacity of a crane varies with its boom's radius, use of outriggers,and quadrant of operation. The working radius of a slewing crane is the horizontal distance from the centre of rotation of the superstructure to the vertical link through the centre of the hoisting hook.
- Outriggers should be fully extended with tyres off the ground to realise the machine's full capacity in a specific quadrant of operation.
- To prevent the possibility of overturning, the crane should be set up on firm level ground, and where required, adequate blocking placed under outriggers.
- The load should be hoisted a small distance and the operation of the brakes checked before any further hoisting for the first lift of the working shift or whenever the loading approaches the maximum line pull of the machine.

(b) Operators should take signals from only one person; in an emergency, however, a STOP signal may be given by anyone.

(c) Routine maintenance, fuelling, or repairs should only be performed while the equipment is stationary.

(d) Check all ropes thoroughly. A. S. 2759--Steel Wire Rope-Application guide gives recommended procedures for selection, use, maintenance and discard of steel wire ropes.

(e) Potential entrapment areas on the crane (e.g. when retracting outrigger the entry of unauthorised persons.

(f) A suitable fire extinguisher should be located in the cab of each crane.

(g) Safety hooks shall be fitted to any crane where the load is to be moved over the head of any person. Taglines should be used when handling loads that will be guided. The taglines should be manilla or synthetic fibre or other electrically non-conductive material.

(h) Work shall only be conducted within the specified distance (Refer Section 4.10 of this manual) to overhead power lines, after approval has been obtained by the employer or principal contractor from the local electricity authority.

(i) For work within the specified distance a person shall be designated as a safety observer. This safety observer--

- shall have a sound knowledge of the work being performed and of the safe working practices applying to that work;
- shall not perform any other work during the period he acts as a safety observer; and shall stop any work which he considers may cause any person on the site to have an electric shock, and shall report this stoppage to the person in charge of the work.

(ii) Any overhead line shall be considered energised unless it is disconnected and physically grounded.

(i) The crane operator should avoid slewing loads over any person. If this is unavoidable, employees should have their work rescheduled so that loads are not moved over their heads.

(i) The employer or principal contractor shall ensure that no load is moved over the heads of non-employees. Where this is not practicable, adequate precautions shah be taken, e.g. suitable overhead protection.

(ii) The crane operator shall ensure that no load is moved over the heads of non-employees unless adequate precautions have been taken.

(j) Where a web sling is used on a project, a backup sling of steel wire rope or chain shall also be used.

(k) A crane must not be left with a load suspended.

8. TRENCHING AND EXCAVATION WORK

Trenching work or excavation work shall only start after a competent person has examined the pan of the site where trenching or excavation will be carried out. This competent person shall determine whether shoring, stepping or battering is required in order to protect any employee or other person.

Where there is a possibility of a person being trapped by a cave-in of the trench, the employer or principal contractor shall ensure there are a number of suitably trained persons at the workplace for the purpose of trench rescue.

Shoring shall be erected and maintained where:

- the depth of the trench or excavation is 1.5m or more;
  and
- the nature of the soil and the slope of the side of the trench, excavation, etc. may cause a fall or dislodgment of earth or other material and bury, trap or strike an employee or other person.

During the course of trenching or excavation work a competent person shall examine the trench or excavation for shoring requirements. This examination shall occur each day before work starts and as often as necessary to determine whether the shoring, stepping or battering remains adequate for preventing a fall or dislodgment of materials into the trench, e.g. immediately after rain.

A person, other than an employee or other person engaged in the erection of shoring, shall not be permitted to enter a trench or excavation unless shoring has been provided and secured.

Where shoring is likely to move inward at the bottom, and bracing or strutting at the bottom is not practicable, then such shoring shall be strutted or braced from a higher level to prevent the inward movement.

Shoring, struts, braces and waling in a trench or excavation shall be secured to prevent any accidental displacement or fall of earth.

Where the walls of an excavation are to be temporarily shored, plans of the shoring shall be prepared by a competent person and kept on the site.

Where shoring is required, trenches shall be shored as the excavation work progresses. Where a mechanical digger is used, the shoring shall be kept as close as practicable to the digger. No employee or other person shall be allowed to work in part of a trench which has not been supported by adequate shoring.

NOTE: Shoring may be exempted if.'

(i) The walls of the trench or excavation are stepped or battered to the appropriate angle paying due regard to the nature of the soil.

(ii) A competent person has certified in writing that stepping or battering is an adequate alternative and this certification is kept at the workplace.

(iii) The design and construction of a steel trench shield is undertaken by a competent person using the relevant Australian Standard for the design of steel structures. **This design should be registered with the Director, and a copy of that design registration kept at the workplace.**

Shoring used in trenching work shall be in accordance with the requirements of the Part XIII--Excavations, Trenches, Caissons, Cofferdams and Tunnels of the *Workplace Health and Safety Regulations 1989.* Shoring shall be of good construction, sound material and free from defects. It shall also be of the required size and strength to fulfil the purpose for which the shoring was provided and secured.

8.1 Access

Safe and serviceable ladders, stairways or ramps shall be provided for access to and exit from every place in an excavation where an employee or other person is required to work.

In every trench 1.5 metres or more in depth, ladders or stairways shall be provided for safe access and exit. Such ladders or stairways shall be spaced no more than 9 metres apart.

Ladders used for access or exit in a trench or excavation, shall extend from the bottom of the trench or excavation to at least one (1) metre above the top.
Where the small size of a trench, excavation, shaft or caisson means it is not practicable to use ladders for access or exit, another means of access or exit shall be provided. This alternative means

of access or exit shall offer the same level of safety as provided by ladders.

Where a shaft or caisson is used for access and haulage purposes it shall be divided into two (2) compartments. One compartment shall be used as a ladder way and the other for haulage purposes. These two compartments shall be securely fenced from each other.

Where it is not practicable to comply with the requirements of the above paragraph because of the shaft or caisson size, another method shall be used to protect the health and safety of an employee or other person. This shall be adopted before any employee or other person is allowed to enter the shaft or caisson.

Ladders, a hoisting appliance or other adequate means shall be provided to enable every person in a trench or excavation to reach a position of safety where there may be a danger to an employee or other person from rising water or an irruption (burst) of water or material.

8.2 Hoisting

A hoist used in connection with trenching work, excavation work or work in a caisson or cofferdam shall:

a) comply with the *Workplace Health and Safety Regulations.*

b) be provided with an automatic load holding device and a manual brake where it is hand operated

c) have a safety hook or a moused shackle attached to the end of the hoisting medium which will prevent accidental dislodgment of the load.

8.3 Barricades

Suitable barricades or guard rails shall be provided as near as practicable to the edge of every accessible part of a trench, excavation, shaft or caisson into which an employee or other person may fall a distance of 1.0m or more. These barricades or guard rails should be provided as soon as possible.

The foregoing requirement shall not apply to any part of a trench or excavation where the barricade or guard rail has been **necessarily** removed to enable access by an employee or other person, or allow the movement of plant, gear or materials.

A protective beam or timber baulk should be placed at the edge of those trenches and excavations where there is a risk that a piece of plant may accidently enter into that trench or excavation.

8.4 Caissons

A competent person shall prepare a plan and specification of the work to be carried out before work starts on a caisson. A copy of the plan and specification shall be kept on the site and shall be available for inspection by the relevant authorities at any time.

The principal contractor shall approve an effective audio and visual warning signal to enable a quick evacuation of a caisson should an emergency arise. This warning signal should be easily seen and heard by any employee or other person.

A caisson shall extend to at least 300 millimetres above ground or water level. In an excavation the caisson shall extend to a point within 1.3 metres of the bottom of the excavation.
In the case of a trafficable or open waterway, the caisson shall extend at least 600 millimetres above the highest high water level.

A steel or any other type liner shall be adequately supported at the top when inserted in an excavated hole. Where the liner is inserted in sections, the sections shall be butt jointed, securely fastened and, where necessary, watertight.

Where a steel or any other type liner of a temporary nature is inserted in an excavated hole, the difference between the diameter of the liner and the diameter of the excavated hole shall not be more than 100 millimetres.

Any shaft of this kind in which a person is required to enter for inspection or work, should be lined with a metal case. Only in uniform ground of proven stability should a person be allowed to enter one of these shafts if it is not lined and then only after a very careful investigation of the walls as the first descent is occurring.

When it is essential for a person to work at the bottom of a shaft they should be attached to the lift

rope by a lanyard and safety harness and should always travel up with each load. Only if the shaft is large enough to enable an effective shelter to be erected at the bottom to keep them safe from any falling objects or material may a person remain at the bottom of a shaft.

> **NOTE:** Wire ropes used in this operation are to be in accordance with--
> A.S. 3569--Steel Wire Ropes, and A.S. 1735--Part 2--SAA Lift Code.

For further information contact your local Mechanical Inspector of Mines, Department of Resource Industries.

The muck bucket should be a type which does not allow it to "hang up" when raised or lowered. It should be attached to the hoist rope by a safety hook or a moused shackle (not just tied on). The hoisting and lowering winch should have a positive drive to control the speed both up and down. This reduces the risk of a free fall at any time, either of the muck bucket or any person.

Where there is room for only one person to work in the shaft it is very important that they wear an effective safety harness and attached life-line at all times to enable them to be quickly brought to the surface in case of accident. Where there is any possibility of toxic or combustible gases being present, tests should be made and precautions taken before a person is permitted to enter a shaft.

Where work is to be performed in compressed air:

- A list of safety procedures shall be prepared by the principal contractor and issued to each employee or other person before they enter that work area.
- Each person shall read the list of safety procedures before entering that work area and the employer or principal contractor shall ensure that the person understands those procedures.
- The Principal Contractor shall continually display the list of safety procedures in a prominent place.
- An employee or other person shall be examined by a medical practitioner a reasonable time before starting work in caissons, and at any further times required by the medical practitioner;
- The principal contractor shall determine the working periods, compression and decompression periods for an employee or other person engaged in the work area. A copy of these working, compression and decompression periods shall be supplied to each person.

8.5 Cofferdams

A plan and specification of the work to be carried out shall be prepared by an competent person before construction of a cofferdam. A copy of the plan and specification shall be kept on the site and shall be available for inspection by the relevant authorities. The plan of work will include emergency procedures and the required training for persons involved in those measures.

A safe means of access or exit shall be provided to a cofferdam by means of boat, ramp, runway or walkway and shall be positioned so that it is in close proximity to where an employee or other person is working. Life jackets and other safety equipment shall be provided, maintained in good order and kept in the immediate vicinity of the working area.

A competent person shall inspect the walls and floor of a cofferdam daily or more regularly if required. Employees and other persons shall be evacuated immediately following the detection of any weakness.

Notice is to be given to the local water authority where a cofferdam is to be constructed in any trafficable waterway.

9. COMMONLY USED RELEVANT STANDARDS

9.1 Scaffolding

All scaffolding shall be of an approved type and be erected in accordance with the requirements of A.S. 1575--Tubes, couplers and accessories used in metal scaffolding, and A.S. 1576--Code of practice for metal scaffolding. The *Workplace Health and Safety Act* requires a certificate of competency, permit or authority, for persons employed to erect or dismantle scaffolding where it is possible for a person to fall 4.5 metres or more from a working platform on that scaffold.

9.2 Formwork and Falsework

A competent person shall prepare designs of formwork and falsework. Formwork and falsework shall be in accordance with A.S. 3610--Formwork for concrete.

Where failure of formwork or falsework could lead to serious bodily injury or loss of life, formwork and falsework plans shall be kept on the site.

9.3 Ladders

Any portable timber ladders used on a project shall be in accordance with A.S. 1688--Portable timber ladders (including step-ladders and trestle-ladders). Any portable metal ladder used on a project shall be in accordance with A.S. 1892--Portable ladders--Patti-Metal.

NOTE: Ladders mentioned in these standards for domestic use are not to be used for construction work.
Any fixed platform, walkway, stairway or ladder to be used on a construction site, shall be in accordance with A.S. 1657--Fixed platforms, walkways, stairways and ladders--design, construction and installation.

9.4 Scaffold Planks

Scaffold planks shall conform with A.S. 1577--Solid timber scaffold planks, and A.S.1578--Laminated timber scaffold planks. Aluminium planks shall be registered with Workplace Health and Safety before use.

9.5 Other Gear

All gear such as chain, chain blocks, bulldog grips, eyebolts, hooks, lifting rings and links, pulley blocks, ropes, shackles, slings, sockets, etc. are to be in accordance with the following standards:

Item of Gear	Applicable Standard
• Alloy Steel Chain Slings	B.S. 3458--Specification for Alloy Steel Chain Slings
• Collared Eyebolts ·	A.S. 2317--Collared eyebolts
• Fibre Rope	A.S. 1504--Fibre rope--Three strand, hawser laid
• Fibre Rope Slings	A.S. 1380--Fibre rope slings
• Gin Blocks	B.S. 1692--Specification for Gin Blocks
• High tensile chain	B.S. 2902--Specification for higher tensile slings and rings, links steel chain slings and rings, links alternative to rings, egg links to rings, egg links and intermediate links
• Higher tensile steel hooks for chains, slings, blocks & general engineering	B.S. 2903--Specification for higher tensile steel hooks for chains, slings, blocks and general engineering purposes
• Lifting Rings and Links	A.S. B291--Lifting rings and links
• Rigging Screws and turnbuckles	A.S. 2319--Rigging screws and turnbuckles
• Round Steel Wire	A.S. 1394--Round steel wire for ropes

• Serial hoists and winches (incl. chain hoists)	A.S. 1418--Cranes (including hoists and winches) Part 2--Serial hoists and winches
• Shackles	A.S. 2741--Shackles
• Sheave Blocks	A.S. 2089--Sheave blocks (including ship's cargo blocks) of maximum lift 60 t
• Short-link chain	A.S. 2321--Short-link chain for lifting purposes (non calibrated)
• Sockets	B.S. 463 Part 1--Specification for sockets for wire ropes
Steel wire rope	A.S. 2759--Steel wire rope--Application guide
· Steel wire ropes ·	A.S. 3569--Steel wire ropes
Swivels	A.S. 2318--Swivels
Synthetic-webbing flat slings	A.S. 1353--Synthetic webbing flat slings
Thimbles	A.S. 1138--Thimbles for use with wire rope or fibre (natural or synthetic) rope

10. SITE FACILITIES AND AMENITIES

10.1 Amenities

Amenities shall be provided on a project to the standard specified in the Code of Practice for Workplace Amenities (available in 1991).

10.2 Construction Camps, Hostels and Caravan Parks

Attention shall be paid to the health and safety of employees when determining the site, layout and operational rules for construction camps, hostels and caravan parks. Additional care is necessary in these areas when the camp, hostel or caravan park is close to the project work site.

10.3 Communications

An adequate means of communication shall be provided on every project to allow prompt medical or other assistance to be sought in case of accident, illness or emergency.

APPENDICES

1. Acts, Regulations, Codes of Practice, Standards and Manuals relevant to the Civil Construction Industry
2. Injury Reporting and Recording Requirements--Form 7 and Form 2

3. Certificates of Competency

4. Occupational Diving
5. Endorsements for Operating Plant in Crane Mode

APPENDIX 1: Acts, Regulations, Codes of Practice, Standards and Manuals relevant to the Civil Construction Industry.

Acts and Regulations

Workplace Health and Safety Act 1989
Workplace Health & Safety Regulations
Electricity Act
Explosives Act 1952-1981
Gas Act
Health Act
Local Government Act
Radioactive Substances Act 1958-1978
Traffic Act 1949-1985

Codes of Practice

Code of Practice for Manual Handling
Code of Practice for Personal Protective Equipment (available early 1991) Code of Practice for Workplace Amenities (available early 1991)

Australian Standards

A.S. 1138	Thimbles for use with wire rope or fibre (natural or synthetic) rope
A.S. 1270	Acoustics--Hearing protectors
A.S. 1319	Safety signs for the occupational environment
A.S. 1336	Recommended practices for eye protection in the industrial environment
A.S. 1338	Filters for eye protectors Part 1 Filters for protection against radiation generated in welding and allied operations
A.S.1353	Synthetic webbing flat slings
A.S.1380	Fibre rope slings
A.S.1394	Round steel wire for rope
A.S.1418	Cranes (including hoists and winches)
A.S.1504	Fibre rope--Three strand, hawser laid
A.S.1558	Protective clothing for welders
A.S.1575	Tube, couplers and accessories used in metal scaffolding
A.S.1576	Code of practice for metal scaffolding
A.S.1577	Solid timber scaffold planks
A.S.1578	Laminated timber scaffold planks
A.S.1657	Fixed platforms, walkways, stairways and ladders--design, construction and installation
A.S.1674	Fire precautions in cutting, heating and welding operations
A.S. 1688	Portable timber ladders (including step-ladders and trestle-ladders)
A.S. 1715	Selection, use and maintenance of respiratory protective devices
A.S. 1716	Respiratory protective devices
A.S. 1735	SAA--Lift Code
A.S. 1796	SAA Welder Certification Code
A.S. 1800	The selection, care and use of industrial safety helmets
A.S. 1801	Industrial safety helmets
A.S. 1873	Explosive-powered hand-held fastening tools, fasteners and explosive charges
A.S. 1891	Industrial safety belts and harnesses
A.S. 1892	Portable ladders
A.S. 2089	Sheave blocks (including ship's cargo blocks) of maximum lift 60t
A.S. 2161	Industrial safety gloves and mittens (excluding electrical and medical gloves)
A.S. 2187	Explosives--Storage, transport and use Part 1 Storage and land transport of explosives Part 2 Use of explosives
A.S. 2188	Magazines for storage of explosives
A.S. 2210	Safety footwear
A.S. 2211	Code of practice for laser safety

A.S. 2294	Protective structures for operators of earthmoving machines
A.S. 2299	Occupational Diving
A.S. 2317	Collared eyebolts
A.S. 2318	Swivels
A.S. 2319	Rigging screws and turnbuckles
A.S. 2321	Short-link chain for lifting purposes (non-calibrated)
A.S. 2397	Guide to the safe use of lasers in the construction industry
A.S. 2550	Cranes--Mobile, tower and derrick--Selection and operation
A.S. 2601	The demolition of structures
A.S. 2626	Industrial safety belts and harnesses--Selection, use and maintenance
A.S. 2664	Earthmoving machinery--Seat belts and seat anchorages
A.S. 2741	Shackles
A.S. 2745	Electrical welding safety
A.S. 2759	Steel wire rope--Application guide
A.S. 2815	Training and Certification of Divers
A.S. 2865	Safe working in a confined space
A.S. 3569	Steel wire ropes
A.S. 3610	Formwork for concrete
A.S. B291	Lifting rings and links
A.S. CA12	Rules for work in compressed air

British Standards

B.S. 463.1	Part 1--Specification for sockets for wire ropes
B.S. 1692	Specification for gin blocks
B.S. 2902	Specification for higher tensile slings and rings, links steel chain slings and rings, links alternative to rings, egg links to rings, egg links and intermediate links
B.S. 2903	Specification for higher tensile steel hooks for chains, slings, blocks and general engineering purposes
B.S. 3458	Specification for alloy steel chain slings

Manuals

Department of Transport--Manual of Uniform Traffic Devices
Department of Transport--Nuclear Testing Manual--Safe Working Practices Division of Workplace Health and Safety--Tower Crane Information Book

APPENDIX 2-Injury Recording and Reporting Requirements Form 7 & Form 2.

Form 7

QUEENSLAND

Workplace Health and Safety Act 1989 (S. 27) Workplace Health and Safety Regulations (reg. 10)

RECORD OF INJURY, ILLNESS AND OCCURRENCE

1. Particulars of *Employer/Principal Contractor.
2. Location of workplace premises:-
   Street Locality/suburb Post Code
3. Personal data:-
Name of injured person
Surname First Name Other **Int/s**

Residential address
Street Locality/Suburb Post Code
Date of birth
Day Month Year Gender

4.Occupation or job title:-
   How long at this occupation/job? Years Months Days
5. Workplace relationship:--
   Employment status:
   Employment basis:
   Employment tenure:
6. time and date of injury or occurrence
7. Type of incident:
8. Agency of injury:
9. Medical treatment:
10. Corrective action identified:
11. How and where did injury, illness or occurrence happen?
12. Description of location of personal damage:

*Employer/Principal Contractor

(Signature & Date)

Employee

(Signature & Date)

*Strike out whichever inapplicable.

Form 2

QUEENSLAND

Workplace Health and Safety Act 1989 (s. 28).

Workplace Health and Safety Regulations (reg. 9(2))

NOTIFICATION OF SERIOUS BODILY INJURY, WORK-RELATED ILLNESS OR DANGEROUS OCCURRENCE

To: The Director,

I hereby notify you of the occurrence of a *serious bodily injury/work-related illness/dangerous occurrence and give the following particulars:

Name of *employer/principal contractor:

Address of *employer/principal contractor:

Location of workplace:

SECTION A

Serious bodily injury or work-related illness

Name of person suffering illness or death or other serious bodily injury:

Residential address of person:

Employer's name:

Employer's address:

Nature of illness or injury i.e. Fatal, Lacerations, Broken bones etc.:

Brief description of *serious bodily injury/work-related illness: Include type of plant or other things involved.

SECTION B Dangerous occurrence

Brief description of dangerous occurrence:

Cause of dangerous occurrence:

Include type of plant or other thing involved:

Signature of *employer/principal contractor:

Date

*Strike out whichever inapplicable

tComplete section if applicable.

APPENDIX 3 Certificates of Competency

GENERAL INFORMATION

General Qualifications for Certificates and Permits: A person applying for a certificate of competency or permit shall:

- be capable of speaking and writing the English language to the extent necessary to perform the duties in a prescribed occupation;
- have attained the age of 17 years.

Procedure for obtaining a Certificate of Competency:

1. Obtain a Permit to Learn by:
   - Completing an "Application for a Permit to Learn" form;
   - Paying the prescribed fee. (Cheques should be made payable to Workplace Health and Safety); and,
   - Sending the form and cheque to the nearest Workplace Health and Safety Office.
2. Gain sufficient practical experience on the type of plant for which you are getting the Certificate of Competency.
3. Once this experience has been gained contact the examining officer to arrange an examination.
4. Pass the practical and oral examination. Your Permit to Learn must be shown to examining officer before starting the exam.
   A prescribed fee is required for the examination. If testing is required for more than one endorsement, an extra fee will be charged for each additional endorsement. This money is to be paid to the examining officer.
   Results will be available after the exam. Failure will result in a three (3) month wait until you can be retested.
   On passing this exam, a report will be given to you. Keep this report because it must be shown to gain a Certificate of Competency.
5. Apply for your Certificate of Competency.

Application for a Certificate of Competency

The application should be lodged at the office of Workplace Health and Safety closest to the place where the examination will be carried out. The certificate of competency will be issued once the money, application form and the report from the examining officer has been received.

The following will be required:

- the completed application form;
- the fee for the examination and issue of a certificate;
- a signature specimen form (an example of your signature on the correct form);
- documentary evidence of necessary experience in the prescribed occupation
  (NOTE: refer to each prescribed occupation for relevant experience). **or**

Where an Accredited Officer has been appointed by this Division to conduct examinations, the following will be required:

- the completed application form;
- the fee for issue of a certificate
- a signature specimen form (an example of your signature on the correct form);
- the statement of attainment issued by an Accredited Officer.
- documentary evidence of required experience in the prescribed occupation
  (NOTE: refer to each prescribed occupation for relevant experience).

Reciprocal Certificate

A Certificate of competency may be granted without examination on a reciprocal basis in recognition for a certificate issued by other States or Territories in Australia.

The following will be required:

- the completed application form;
- the fee for issue of the certificate;
- a signature specimen form (an example of your signature on the correct form);
- the Certificate of Competency from other State or Territory, or a verified copy of this Certificate of Competency.

Examinations (General)

- examinations are as follows:-
  crane and plant operators--oral theory and practical exam components
  riggers, crane chasers, dogman and EPT operators--written theory, oral and practical exam components
  scaffolders--written theory and practical exam components
- the candidate must be the holder of a Permit to Learn to be eligible to be examined;
- pass marks are as follows:-
  crane chaser--a pass mark of 60% overall is required for theory examination, a pass satisfactory to the examiner in the practical test and 100% for compulsory hand signals. Candidates who fail a colour test will not be issued with a certificate.
  crane operator--a pass mark of 60% overall is required for theory examination, and pass satisfactory to the examiner in the practical test.
  dogman--a pass mark of 60% overall is required for theory examination, a pass satisfactory to the examiner in the practical test and 100% for compulsory hand signals. Candidates who fail a colour test will not be issued with a certificate.
  explosive-powered tool operator--a pass mark of 60% overall is required for theory examination, a pass satisfactory to the examiner in the practical test and 100% for the selection of charges by colour. Candidates who fail a colour test will not be issued with a certificate.
  plant operator--a pass satisfactory to the examiner.
  rigger--a pass mark of 60% overall is required for theory examination, a pass satisfactory to the examiner in the practical test and 100% for compulsory hand and whistle signals.
  scaffolder--a pass mark of 60% overall is required for theory examination, a pass satisfactory to the examiner in the practical test and 80% for compulsory questions.
- a candidate who fails the examination will not be eligible to sit again until a period of 3 months has elapsed and will be required to pay the prescribed fee for re-examination.

Some information on the following Certificates of Competency is provided:--

Crane Chaser	Plant Operator
Crane Operator	Rigger
Dogman	Scaffolder
Explosive-Powered Tool Operator	Welder

For further information contact:

Examinations Section
Workplace Health and Safety GPO Box 69
Brisbane 4001
Phone: (07) 239 6295

OR your local District Office

CRANE CHASER CERTIFICATE

A crane chaser certificate is required for the slinging and directing of loads handled by a crane where the load is at all times in full view of the crane operator.

Exemption--A crane chaser will not be required when the load is at all times accessible to the operator of the crane and is less than 10m from the crane operating position.

Qualifications For Crane Chaser--An applicant for a certificate of competency as a crane chaser shall:

- have 3 months experience in the occupation of crane chaser.
- be the holder of a Permit to Learn for the prescribed occupation of crane chaser for the period of practical experience and for the practical examination;
- pass an examination which demonstrates a sound knowledge of the duties and skills of a crane chaser.

NOTE: Certificates of competency from outside Australia or other documentary evidence of experience obtained from areas not covered by the Workplace Health and Safety Act may be included in the 3 months experience.

CRANE OPERATOR CERTIFICATE

Relevant crane operator endorsements for the civil construction industry are:--

1-A-2	Tower Crane	3-D-1	Slewing Lattice Boom not exceeding 20t
4-A-2	Materials Hoist		
4-A-3	Men & Materials Hoist	3-D-2	Slewing Lattice Boom not exceeding 80t
3-B	Non Slewing Crane		
3-A-2	Vehicle Loading Crane	3-D-3	Slewing Lattice Boom, Any
3-C-1	Slewing Hydraulic Boom not exceeding 20t		
3-C-2	Slewing Hydraulic Boom not exceeding 80t		
3-C-3	Slewing Hydraulic Boom, Any		

Endorsements

7-A-2 Excavators, Any 7-B End loader 7-C Dragline

Qualifications for Crane Operator A person applying for a certificate of competency as a crane operator shall:

- be the holder of a Permit to Learn in the relevant category of crane operator
- have sufficient practical experience to display competency in the operation of a crane;
- pass an examination which demonstrates a sound knowledge of the duties of a crane operator.

NOTE: For some categories of crane operator the amount of practical experience is not specified, though the following Certificates of Competency require the experience specified:--

Certificate	Practical Experience
Tower Crane (l-A-2	100 hours on l-A-2
Slewing Mobile Crane--Hydraulic Boom--capacity not exceeding 20 tonnes (3-C-1)	100 hours on 3-C-1
Slewing Mobile Crane--Hydraulic Boom--capacity not exceeding 80 tonnes (3-C-2)	100 hours on 3-C-2 (exceeding 20t) OR holds either a 3-C-1 or 3-D-1 and 30 hours experience on 3-C-2 (exceeding 20t)
Slewing Mobile Crane--Hydraulic Boom--any (3-C-3)	100 hours on 3-C-3 (exceeding 80t) OR holds either a 3-C-2 or 3-D-2 and 30 hours on 3-C-3 (exceeding 80t) OR holds a 3-C-1 or 3-D-1 and 60 hours experience on 3-C-3 (exceeding 80t)
Slewing Mobile Crane--Lattice Boom--capacity not exceeding 20 tonnes (3-D-l)	100 hours on 3-D-1 OR holds 3-C-1 and 30 hours on 3-D-1
Slewing Mobile Crane--Lattice Boom--capacity not exceeding 80 tonnes (3-D-2)	100 hours on 3-D-2 (exceeding 20t) OR holds either 3-C-2 or 3-D-1 and 30 hours on 3-D-2 (exceeding 20t) OR holds 3-C-1 and 60 hours on 3-D=2 (exceeding 20t)
Slewing Mobile Crane--Lattice Boom--any (3-D-3)	100 hours on 3-D-3 (exceeding 80t) OR holds 3-D-2 or 3-C-3 and 30 hours on 3-D-3 (exceeding 80t) OR holds 3-C-1 or 3-D-1 or 3-C-2 and 60 hours on 3-D-3 (exceeding 80t)

DOGMAN CERTIFICATE

- A dogman's certificate is required for the slinging and irecting of loads handled by a crane where the load is not at all times in full view of the crane operator.

Qualifications for Dogman--An applicant for a certificate of competency as a dogman shall:

- have 6 months experience in the occupation of dogman.
- be the holder of a Permit to Learn in the prescribed occupation of dogman during the period of practical experience and for the practical examination.
- pass an examination which demonstrates a sound knowledge of the duties and skills of a dogman.

EXPLOSIVE-POWERED TOOL OPERATOR CERTIFICATE

An explosive-powered tool operator's certificate is required For the safe and efficient operation of an explosive-powered tool. An explosive-powered tool means a tool whereby a stud, pin, dowel, screw, rivet, nail, spike, bolt or other object may be driven against, into or through any substance by means of an explosive charge.

Qualifications for Explosive-powered Tool Operators--An applicant for an explosive-powered tool operator certificate of competency shall-

- be the holder of an explosive-powered tool operator's Permit to Learn for a period sufficient to gain experience to display competency in the use of an explosive-powered tool;
- pass an examination which demonstrates a sound knowledge of the duties and skills of an explosive-powered tool operator.

PLANT OPERATOR

A plant operator may receive endorsements in:--

Class A--Grader
Class B--Tractor
Class C--Dozer
Class D--Road Roller
Class E--Skid Steer Loaders
Class F--Trencher
Class G--Scraper
Class H--Other Plant

Qualifications for Plant Operator--An applicant for plant operator shall-

- be the holder of a Permit to Learn in the relevant category of plant operator have sufficient practical experience to display competency in the operation of plant;
- pass an examination which demonstrates a sound knowledge of the duties of a plant operator.

RIGGER CERTIFICATE

A rigger certificate is required for the rigging and safe rigging involved in the erection, positing or dismantling of any building or structure or plant that requires the erection of tackle involving the use of wire, fibre rope or other gear for the purpose of lifting or lowering or moving an object.

Classes of Certificate

Class I Rigging for the erection and dismantling of a building or structure or of plant;

Class 2 Rigging for the erection and dismantling of a building or structure;

Class 3 Rigging for the erection and dismantling of plant.

Qualifications For Rigger--An applicant for a certificate of competency as a rigger shall:

- have 12 months experience in the occupation of rigger;
- be the holder of a Permit to Learn in the prescribed occupation of rigger for the period of practical experience and for the practical examination;
- pass an examination which demonstrates a sound knowledge of the duties and skills of a rigger.

NOTE: Certificates of competency from outside Australia or other documentary evidence of experience obtained from areas not covered by the Workplace Health and Safety Act may be included in the 12 months experience.

A candidate who successfully completes the Rigger class 1 or 2 or 3 course and passes the examination may also be issued with a dogman's certificate on passing the dogman's practical test, providing satisfactory documentary evidence of 6 months experience as a dogman has been produced and the additional fee for the examination and issue of certificate has been paid.

SCAFFOLDER CERTIFICATE

A scaffolder certificate is required for the erection and dismantling of any structure, staging or platform set up or used in connection with the performance of work or for the protection of person engaged in work and includes false work exceeding 4.5m in height.

Classes of Certificates

Class 1 Erection or dismantling of any scaffolding;
Class 2 Erection or dismantling of any frame or modular scaffolding not exceeding 15m in height or timber scaffolding;
Class 3 Erection or dismantling of any frame, modular, tube and coupler or bracket scaffolding;
Class 4 Erecting or dismantling of any boatswain chair, swing stage, suspended platform or heavy duty suspended scaffolding;
Class 5Erection or dismantling of any frame or modular mobile scaffolding.

(Scaffolder Class 1 consists of scaffolder Classes 2, 3, and 4. Scaffolder Class 5 is included in Scaffolder Class 2.)

Qualifications for Scaffolder--An applicant for a certificate of competency as a scaffolder shall:

- have the following experience applicable to the class of scaffolding certificate;
  (a) class 1, 3 and 4 -- 12 months
  (b) class 2 -- 3 months
  (c) class 5 -- sufficient experience to demonstrate performance in the erection of the scaffolding;
- be the holder of a scaffolder's Permit to Learn for the period of practical experience and for the practical examination;
- pass an examination which demonstrates a sound knowledge of the duties and skills of a scaffolder.

NOTE: - Certificates of competency from outside Australia or other documentary evidence of experience obtained from areas not covered by the Workplace Health and Safety Act may be included in the required experience needed.

WELDER CERTIFICATES

The following categories are included within the scope of a Welding Certificate-

No. 1 Manual metal-arc (MMA) welding of carbon steel plate and double butt welded carbon steel pipe.
No. 1E Manual metal-arc (MMA) welding of carbon steel plate and carbon steel pipe over 270 mm outside diameter. Manual metal-arc (MMA) welding of carbon steel pipe.
Manual metal-arc (MMA) welding of alloy steel plate and double butt welded alloy steel pipe.
Manual metal-arc (MMA) welding of alloy steel plate and alloy steel pipe over 270 mm outside diameter.
Manual metal-arc (MMA) welding of alloy steel pipe.
Gas tungsten arc/manual metal-arc (GTA/MMA) welding of alloy steel pipe.
Gas welding (FG).
Gas tungsten arc (GTA) welding.
Gas metal arc (GMA/FCA) welding.
Automatic welding.
Welding Supervisor.

A.S. 1796--Welder Certification Code gives details about experience and qualifications for the different categories of welders.

APPENDIX 4--Occupational Divers

The following information is for all occupational divers operating in Queensland waters--

Occupational Diver Certification--All occupational divers are required to be certified to:

- 2815--Training and Certification of Divers, Part 1 for SCUBA
- 2815 Part 2 for SSBA to 20m; and
- 2815 Part 3 for SSBA to 50m.

Previously many divers have applied to the Victorian Department of Industry and Office of Economic Planning for certification in accordance with this Standard through the provision of a "grandfather clause". However, accreditation through this clause ceased on 31 July 1990.

Under this clause the minimum pre-requisites for certification to A.S. 2815 Part 1 included at least 900 minutes of work-related underwater diving as follows--

0-15m	400 min
15-20m	500 min
	---
	900 min

For certification to Part 2 of A.S. 2815 a total of at least 1200 minutes of work related underwater diving is required as follows--

0-1 lm	500 min
11 - 19m	400 min
at 20m	300 min

	1200 min

All Queensland occupational divers who were unsuccessful in their application for certification under the grandfather clause, and believe that they fully comply with the above requirements, may resubmit their application to the Director, Workplace Health and Safety for reconsideration. This resubmission must include appropriate support documentation (eg. logbooks, vessel logs, statutory declarations). Resubmissions including all of the required supporting documentation will be received up to 31 March 1991.

Experienced scuba divers not yet certified to A.S. 2815 may undertake the A.S. 2815 Part I upgrade course and gain accreditation by this means. Approved courses may be available in the future. Workplace Health and Safety Inspectors (Diving) will provide names of approved providers on request.

With the Part 2 certification, underwater working skills are included along with the diving skills. These working skills include underwater welding, cutting, etc. and are not necessarily required by all divers using SSBA. For this reason a restricted Part 2 certification is offered which trains divers to use SSBA only.

However, the restricted Part2 certification is recognised only within Queensland and does not qualify a diver for the issue of a full Part 2 certification.

It is envisaged that the study modules undertaken to qualify for a restricted certificate will subsequently be credited towards a full certificate. If this procedure is finally agreed to only the outstanding modules will need to be completed for issue of a full certificate.

For uncertificated divers already experienced in using SSBA who only require a restricted Part 2 certification an upgrade course is being considered. Details will be released following further consultation with representatives of the occupational diving communities. Contact Workplace Health and Safety Inspectors (Diving) for further details.

Variations to A.S. 2299--A number of variations to A.S. 2299 Occupational Diving, have been approved including an increased depth limit to 30m for SCUBA.

Hyperbaric facilities--The Bureau of Emergency Services is presently reviewing the provision of emergency hyperbaric facilities in Queensland.

Other Information

(a) **A National Training Standards Committee** for occupational divers has been formed by the Professional Divers Association of Australia. All statutory authorities and relevant industry associations are also represented. The function of this committee is to review the training needs of occupational divers throughout Australia and make appropriate recommendations

when necessary to help ensure uniformity.

(b) **Postgraduate students** engaged in underwater diving for research towards a higher degree are in most cases not covered by requirements of the *Workplace Health and Safety Act.* If the student is not an employee and therefore is not being paid to engage in the underwater research then the *Workplace Health and Safety Act* will not apply, provided the dive site is not a workplace under the *Workplace Health and Safety Act.*

The dive site will become a workplace if the students are part of a team which includes employees engaged in work at the site. Whilst the students are not required to comply with the diving regulations provided they are observers rather than workers, they are nevertheless required to comply with the duty of care provisions within Section 14 of the Workplace Health and Safety Act.

(c) **Visiting scientists** who engage in private underwater research (i.e. not in the role of an employee) will generally fall into the same category as postgraduate students. Under these conditions the comments given under (b) will apply.

(d) **The medical examination** required by A.S. 2299 includes long bone x-rays. These x-rays are required at the initial examination only. Subsequent long bone x-rays are at the discretion of the medical practitioner.

APPENDIX 5--Endorsements for operating mobile plant in the crane mode

Crane Operator's Certificate--Excavator Endorsement (7-A-2)

Crane Operator's Certificate--Front End Loader Endorsement (7-B)

Crane Operator's Certificate--Dragline Endorsement (7-C)

Qualifications.

- No specific pre-examination qualifications are required, BUT you must ensure you have received sufficient training and experience.
- You must be the holder of a Permit to Learn in the relevant category.

Examination.

The exam is oral and practical.

NOTE: Mobile plant used in the crane mode may need modifications. Please contact your local Workplace Health and Safety Inspector for advice.