

1. MANUAL HANDLING HAZARDS

1.1 INTRODUCTION

The *Occupational Safety and Health Regulations* require manual handling hazards to be identified, their risks assessed, and the means by which the risks may be reduced considered¹. This code of practice sets out a three step process to assist those who are obliged to meet those requirements. Other sections in the code provide more information on each step.



Follow-up and review is an essential aspect of any risk management plan. Control measures need to be reviewed to determine if risk is eliminated or controlled, or if new hazards have been introduced. Advice on follow-up and review is provided in section 5 of this code.

¹ Regulation 3.4 Manual Handling

1.2 INTERPRETATION

In this code of practice —

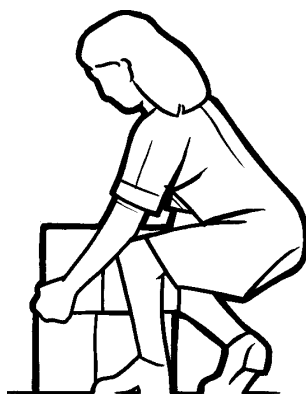
“manual handling” means any activity requiring the use of force exerted by a person to lift, lower, push, pull, carry or otherwise move, hold or restrain a person, animal or thing.

Note Manual handling also includes any activity involving repetitive and/or forceful movements (eg. keying data into a computer; using a screwdriver) and any activity where the person must maintain constrained or awkward postures (eg. driving a truck; leaning over to make beds).²

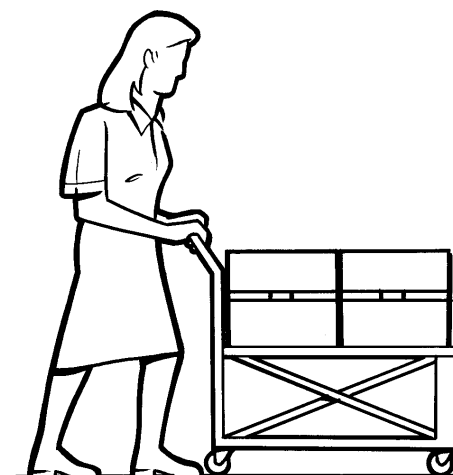
Examples of manual handling activities include:



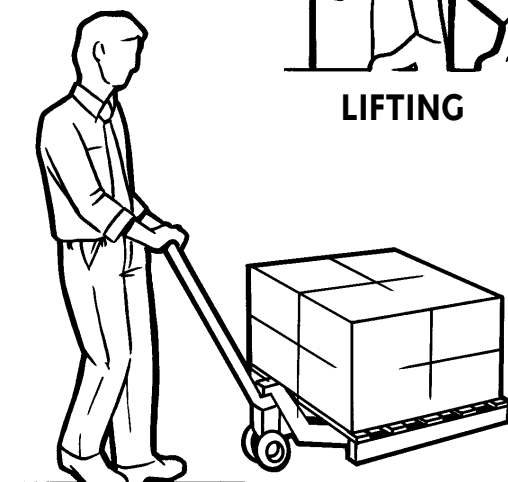
CARRYING



LIFTING



PUSHING



PULLING



HOLDING

² Where these types of activities are the main concern, the *National Code of Practice for the Prevention of Occupational Overuse Syndrome* [NOHSC:2013(1994)] should be used instead of this code. NOHSC:2013 is an approved code of practice under the *Occupational Safety and Health Act 1984*.

“hazard” means *anything that may result in injury or harm to health*³...

Many workplace hazards are environmental, for example slippery floors, unguarded machines, poor lighting and solvent vapours. However a manual handling hazard is an actual activity requiring the use of force. Such as when lifting a heavy box.

Anything that increases the likelihood of a hazard causing injury or harm to health is known as a ‘risk factor’. Using the example of the heavy box, the activity of carrying the box would be the actual hazard, while the weight of the box would be a risk factor. The heavier the box, the greater the likelihood that carrying the box could cause an injury.

“activity” refers to the movements by or postures of an employee at any given time in order to perform a task.

“task” refers to any sequence of activities performed by an employee as part of their job.

1.3 HOW DOES MANUAL HANDLING RESULT IN INJURY?

Injuries most commonly linked with manual handling include sprains and strains, damage to the back and hernias. The ways in which manual handling causes an injury are complex. However, in general, the injuries are caused by wear and tear and damage to the joints, ligaments, muscles and intervertebral discs which occur during manual handling activities.

Manual handling injuries may result from:

- gradual wear and tear caused by frequent or prolonged periods of manual handling activity (eg. a storeperson continually handling stock between deliveries);
- sudden damage caused by intense or strenuous manual handling or awkward lifts (eg. a labourer lifting a compactor or a glazier lifting a pane of large glass from the ground on to a truck); or
- direct trauma caused by unexpected events (eg. a storeperson walking on uneven ground carrying a large heavy carton, trips and falls).

Experience has shown most manual handling injuries are associated with day to day tasks. Very often there is no ‘accident’ (sudden or unexpected event) associated with the injury. The person may not feel pain until several hours after the injury occurs. This means an investigation into a manual handling injury must look at all relevant tasks the injured person usually performs.

³ Section 3 Occupational Safety and Health Act 1984

1.4 RISK FACTORS IN MANUAL HANDLING

The weight of an object is not the only risk factor. A box lifted from the floor, for example, is more likely to cause injury than a box of the same weight lifted from waist height where no bending is required.

A number of factors can increase the risk of injury, including:

- size, shape and weight of objects (if carried or held) and forces required (if pushed, pulled or restrained);
- sudden unexpected or jarring movements;
- awkward movements, such as twisting, bending, over-reaching, especially if combined with load handling;
- static postures, like holding the body or part of the body in a fixed position for a long time; and
- personal factors, such as age, physical dimensions and any disabilities the person may have.

These risk factors are influenced by:

- how long and how often the tasks are performed (eg. repetitive movement);
- the way work is organised, such as one employee performing all manual handling tasks instead of tasks being shared by several employees;
- design and layout of work environment; and
- the degree of familiarity with the task and associated training.

1.5 PREVENTING MANUAL HANDLING INJURIES

Manual handling is an essential activity in most workplaces. The way to overcome manual handling problems is to address tasks systematically, through the following three steps.

Occupational Safety and Health Regulation 3.4 specifies that manual handling hazards must be identified, their risks assessed and consideration be given to controlling these risks. This code of practice explains how to implement regulation 3.4 by applying the Three Step Process and the various stages that make up each Step. This three step approach should form the basis for all manual handling risk management. Further details regarding this process are outlined in the relevant sections of this code.

1.6 IMPORTANT DECISIONS

Before commencing the three step approach, some important decisions need to be made:

- **Who should be involved?**

When carrying out the three step approach one or more persons should be involved, depending on the size of the workplace, for example, the area supervisor, safety and health representative, and the person doing the job.

Expert or specialist advice may be useful in making difficult or complex risk assessments (Step 2) and developing risk control procedures (Step 3). A person with an ergonomics background may be appropriate for helping to assess the risk, whereas a person with an engineering background may be more suitable for helping to control the risk.

Where a safety and health committee exists it should monitor the implementation of the three step approach.

- **What skills and knowledge are needed?**

People using the three step approach need to understand in relation to manual handling:

- the *Occupational Safety and Health Act 1984* and relevant *Occupational Safety and Health Regulations 1996*;
- the role and responsibilities of the employer, employees and others at the workplace;
- the relevant work activities of the workplace; and
- how to assess manual handling activities using this code of practice.

- **What consultation should take place?**

Discussion should take place between the employer, employees who perform manual handling work and, where they exist, their safety and health representatives. This way, the day-to-day experiences and knowledge of employees can be used.

Details on how consultation will take place can be determined before the three step process begins. For example, those involved will need to select teams or individuals who will be responsible for each of the three steps. They will need to decide how discussion and agreement will take place in dealing with hazards and risks, how each step will be carried out, and what they intend to achieve.

- **Should records be kept?**

Employers should give consideration to keeping records.

Keeping of records is part of good management for all activities in your workplace. This includes recording any assessment of the risks associated with manual handling and the resulting implementation of control measures. Such records are a valuable reference in the event of an injury being reported.

Good records can show that correct procedures were developed for the management of manual handling in the workplace. The material in Appendices C, D, E, F and G could form the basis of these records.

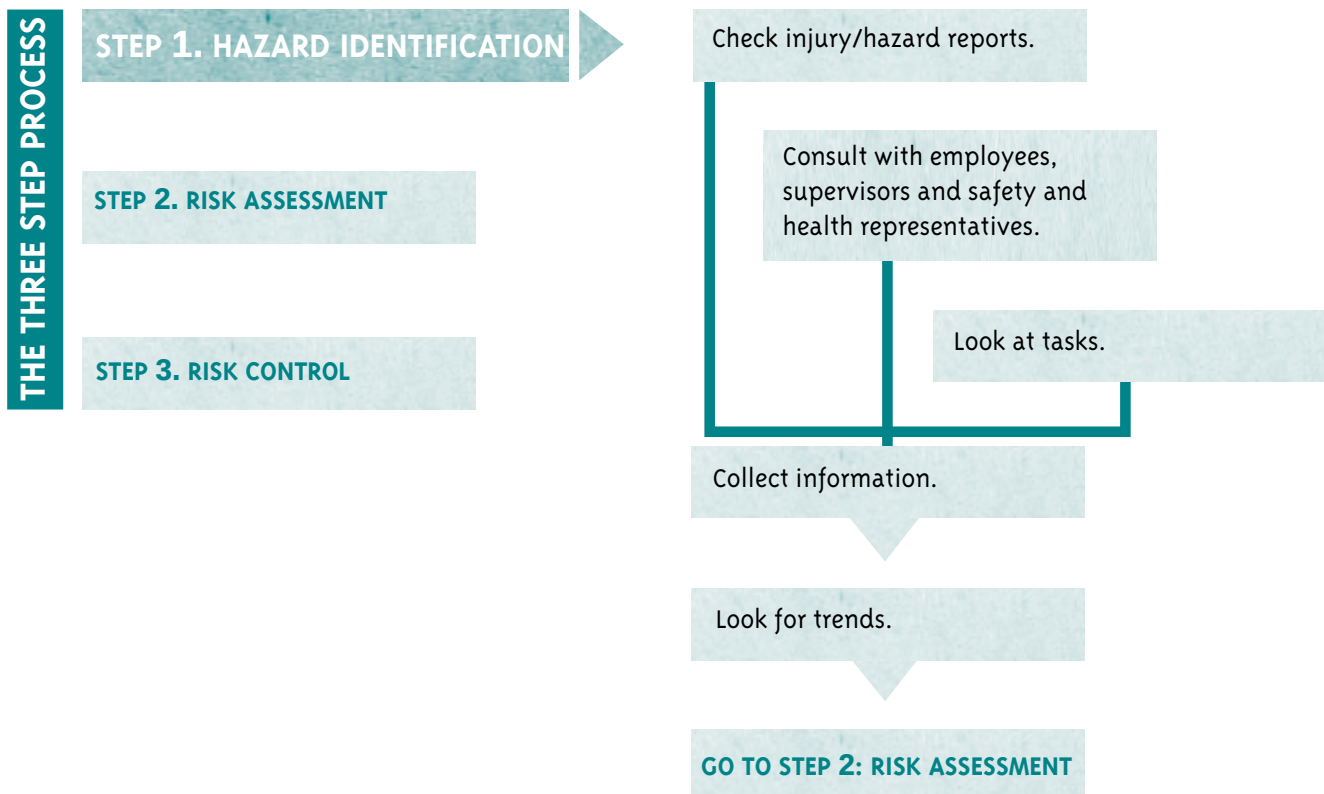
2. HAZARD IDENTIFICATION

2.1 WHAT IS INVOLVED?

Under regulation 3.4(2)(a) an employer, the main contractor, or a self-employed person must identify each hazard that is likely to arise from manual handling at the workplace. This includes the identification of manual handling tasks and activities that may give rise to injuries or harm or those where employees have identified concerns.

2.2 HOW DO YOU IDENTIFY HAZARDS?

There are a number of ways to identify hazards. One way is illustrated in the Hazard Identification flow diagram which breaks down Step 1 - Hazard Identification into 5 stages. These stages are detailed below.



1 **Check injury/hazard reports**

Check injury, incident and hazard reports for injuries or hazards related to manual handling. Information on this is provided in Appendix B to assist in identifying manual handling injuries from commonly used injury classification systems.

2 **Consult with employees, supervisors and safety and health representatives**

It is important to ask a range of employees to take into account different levels of experience and physical characteristics. Consultation should include the following:

- Asking employees about which manual handling tasks they consider may lead to physical strain.
- Talking to supervisors about any difficulties they are aware of that their staff have experienced carrying out manual handling tasks.
- Consulting with safety and health representatives on manual handling problems that they have become aware of as part of their functions.

3 **Look at tasks**

- Carry out workplace inspections and identify any relevant contributing factors, eg. slippery floors.
- Observe the manual handling tasks.

4 **Collect information**

From checking injury/hazard reports, asking other people in the workplace and looking at the tasks you can collect information on:

- tasks performed, eg. changing a tyre;
- age and sex distribution of those injured through manual handling;
- occupation, department or section of those injured or involved in the manual handling;
- geographical location where the injury or complaint occurred;
- type of injury; and
- any other relevant information.

A suggested form for collection of this information and a completed example is included at Appendix C.

5 **Look for trends**

From the collected information identify trends or common problems by sorting it into the categories listed in section 4 above.

- *For tasks* - trends may show the presence (or lack) of risk factors across the various activities that comprise a task (as seen in gradual wear and tear injuries).
- *For occupations, departments or sections* - trends may show risk factors in a range of activities done by people working in these areas (usually resulting in gradual wear and tear problems). A high number of accidents or complaints for an occupational group may also indicate a

greater likelihood of injury. This information is useful during Step 2: Risk Assessment when determining which risk factors to address first.

- *For age and sex categories* - trends may indicate particular employee groups who are most at risk. For example, statistics for Western Australia show that the severity of manual handling injuries tends to increase with age in men whereas more severe injuries are experienced at a much younger age in women.
- *For locations* - trends may indicate problems from lack of space (causing awkward postures), poor lighting or uneven work surfaces.
- *For types of injury* - trends may highlight that the injuries are cumulative in nature.

2.3 WHERE TO FROM HERE?

By reviewing the accident reports available at your workplace, consulting with relevant people and looking at the tasks you should now have the information which will help you to identify trends in manual handling injuries in your workplace.

These trends will assist you in determining which tasks pose a more serious problem than others and allow you to undertake an assessment under Step 2: Risk Assessment.

3. RISK ASSESSMENT

3.1 WHAT IS INVOLVED?

Under regulation 3.4(2)(b) an employer, the main contractor or a self-employed person must assess the risk of injury or harm resulting from each manual handling hazard. Risk assessment involves:

- determining the potential for each hazard to cause injury to a person performing the task; and
- understanding why it is a problem.

3.2 HOW TO ASSESS RISKS?

There are probably a number of manual handling hazards identified under Step 1. Selecting which should have priority over others for further assessment and control (understanding why they are problems) is therefore very important.



1

Prioritise manual handling tasks

In deciding which manual handling tasks should have priority for assessment, the following should be considered:

- the number of injuries⁴ compared with the number of employees likely to be undertaking manual handling tasks. The greater the number of injuries in relation to the number of employees exposed, the greater the risk of injury and therefore the obligation of the employer to assess the task;
- the severity of the injuries. The amount of time lost from work can indicate the severity of injuries. The more severe an injury, the higher the priority for risk assessment;
- the number of employees at risk of severe injury. Tasks where there are both high numbers of employees at risk of injury and the injuries are of high severity should be given the highest priority for risk assessment; and
- the number of employees at risk and the severity of potential injury or harm. Tasks identified by employees, safety and health representatives or supervisors or through workplace inspections to have potential for injury may have a lower priority than those where injury has occurred. Setting the priority for these tasks should be based on the number of employees potentially at risk and the severity of the potential injury or harm.

2

Select task

From the priority list of tasks begin with the highest priority task and work through to the lowest priority. If it is a complex task (a task with a sequence of activities) it is easier to divide the task into its various activities. Each activity can then be checked for risks in terms of weights, forces, actions, movements, and the people doing the work.

For example, a number of injuries at a nursing home have been associated with the task of showering a patient. This task could be broken into the following activities:

- lifting the patient out of bed and transferring to a wheelchair;
- pushing the wheelchair to the shower;
- transferring the patient into a shower chair;
- showering the patient;
- transferring the patient back into the wheelchair;
- dressing the patient; and
- pushing the wheelchair to the day room.

It can also be very useful to divide tasks into activities when there are no obvious practical solutions.

3

Understand why the manual handling task is a problem

It is important to understand why a manual handling task has a high risk of injury in order to find possible solutions. Performing a risk assessment of the task enables the manual handling problems to be looked at from a number of different angles and in more detail. It helps to avoid wrong conclusions and inefficient use of resources.

⁴ Some manual handling injuries are not specifically related to a task and are cumulative in nature. All tasks performed by an employee who has a cumulative injury should be considered when determining priority tasks.

- Watch and discuss the risk factors for each selected task with employees and supervisors doing the work.
- Apply the risk assessment checklist on the *Risk Assessment Form* (Appendix E) to the selected task. The four principal risk areas covered by the checklist are:
 - actions and posture;
 - load;
 - work environment; and
 - characteristics of employees.

How long and how often a load is handled are important factors influencing the degree of risk associated with the types of actions and postures used, and the weight of the object that is handled.

In completing the checklist, determine how each risk factor applies to the task. Rate each factor as “not applicable”, “low”, “medium” or “high”, based on guidance material in *Guidance Material for Rating Risk Factors* (Appendix H). Record reasons for the rating in the comments section of Appendix E. If the risk factors identified on the checklist are insufficient to understand the problem satisfactorily, then more detailed specific information or specialist advice should be sought.

The completed risk assessment should provide a clear understanding of the four principal risk areas for each activity. A completed example of the *Risk Assessment Form* is included at Appendix E.

3.3 WHERE TO FROM HERE?

Now that you have assessed the risk of each manual handling task, or activity, in the order in which they were ranked and you understand the nature of the problem associated with the particular task or activity, then proceed to Step 3: Risk Control.

4. RISK CONTROL

4.1 WHAT IS INVOLVED IN CONTROLLING THE RISK?

Under regulation 3.4(2)(c) an employer, the main contractor or a self-employed person must consider the means by which the risk may be reduced. Once the manual handling tasks have been assessed, the risk should be controlled by eliminating or reducing the risk factors that have been identified during the assessment step.

4.2 FINDING SOLUTIONS - DEVELOPING CONTROL OPTIONS

To remove or reduce the risks suitable manual handling controls need to be developed. The controls should involve:

ELIMINATING THE MANUAL HANDLING ACTIVITIES

OR

PROVIDING APPROPRIATE MANUAL HANDLING TRAINING.

WHERE THIS IS NOT PRACTICABLE, REDESIGNING THE WORK, THE WORKPLACE OR EQUIPMENT IN THE WORKPLACE TO MINIMISE THE RISK OF INJURY, INCLUDING MODIFYING THE TASK TO SUIT THE WORKER.

The following three questions may assist in working through this sequence.

Question 1

Is the manual handling activity necessary?

If the answer is no, the other two questions do not need answering.

For example: If polishing corridor floors is not a necessary activity, one solution to the manual handling problems would be to cease the activity. This way the manual handling hazards can be eliminated.

If the answer is yes, the manual handling activity is necessary, answer question 2 and question 3.



Question 2

Can the work be changed to eliminate, reduce or control the risk of injury?

Strategies to change work should be aimed at reducing risk factors associated with actions, posture, load and work environment.

Risk factors can be reduced by a number of approaches, including:

- modifying workplace layout and equipment;
- modifying the load;

- controlling the work environment;
- redesigning work patterns; and
- warming up and stretching prior to manual handling.

Further explanation of these control strategies is detailed below.

- **Modifying workplace layout and equipment**

Re-arrange the layout or design of plant, equipment and furniture to reduce twisting, reaching, stooping and poor application of force. Introduce lifting devices and mechanical equipment where practicable.



FIGURE 1 - Store heavier and frequently used items at waist level



FIGURE 2 - Use levers to reduce the force required



FIGURE 3 - Raise work level by use of self-adjusting platform

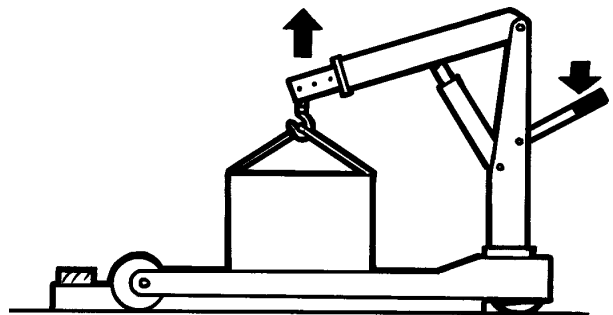


FIGURE 4 - Use mobile crane to avoid manual lifting

- **Modifying the load**

The load being handled can be modified or re-packaged into bigger or smaller weights, or into different size or shape.

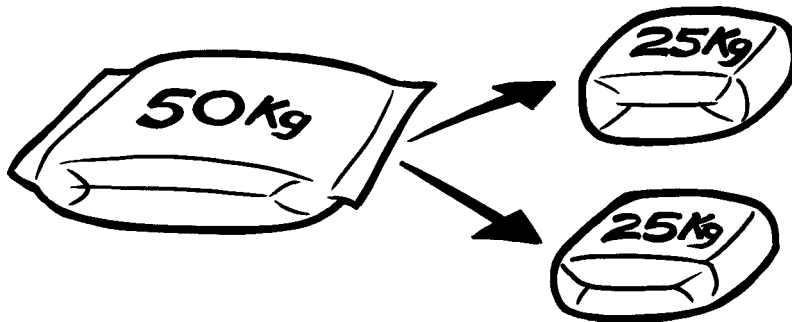


FIGURE 5 - Reduce the risk by lightening the load

- **Controlling the work environment**

This involves changing or modifying work environment factors that affect manual handling. For example, providing adequate space for handling objects or improving the lighting.

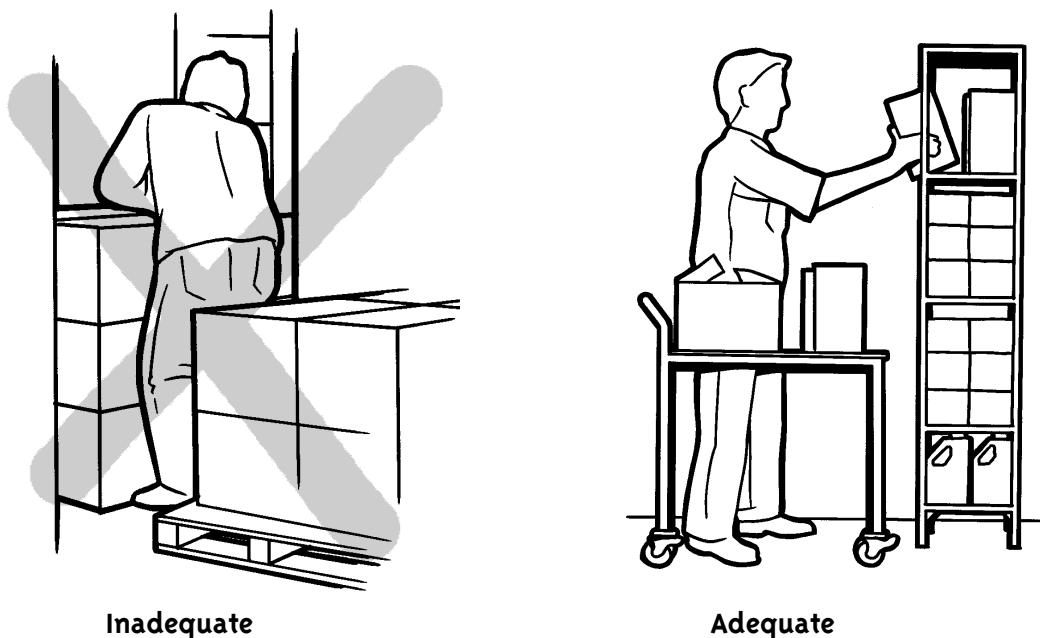


FIGURE 6 - Provide sufficient space for handling

Further examples of strategies to redesign the workplace are contained in Appendix I.

Maintenance of the workplace and equipment is essential for safe manual handling. An adequate hazard reporting system and preventive maintenance program will help to ensure equipment and the work environment are kept safe.

- **Redesigning work patterns**

Redesigning an employee's work pattern may involve changing how long an activity is done, how often it is done, and how it is done. These changes should result in a wider variety of actions and postures.

In some cases it may not be possible to vary the actions and postures for the manual handling activity causing the problem. It may be necessary to introduce suitable variations through other activities performed by the employee. Options to achieve more varied actions and posture are:

- rotation of employees through other tasks that require different actions and postures; and
- changing the job to include different actions and postures as part of daily routine.

Other strategies to redesign work patterns include:

(i) Safe work rates

Work performance varies between individuals and over time, and can be influenced by work and equipment factors. In determining safe work rates, some of the factors that need to be considered are:

- physical differences between people (eg. size and strength);
- skills, knowledge and experience of employees;
- the training that has been received;
- type of work and equipment;
- how long the activity is done for; and
- quality of work required.

(ii) Mix of tasks

Where an activity requires a long period of repetitive actions or fixed postures, and it is not possible to vary the activity, breaks should be provided. These breaks should be made up of other tasks. The length and frequency of breaks will depend on the type of tasks that make up the job.

(iii) Peak demand

Many activities have predictable peak periods, with wide variations in work demand. Increased manual handling risks during these peak periods can be prevented by providing sufficient people and equipment to cope during times of increased work.

(iv) Working hours

It may be necessary to determine whether the type of manual handling work performed is suitable for extended hours or shifts. Work that is heavy, repetitive or demanding may need further consideration.

(v) Special individual needs

It can be particularly important to provide suitable work patterns for employees with special needs. For example, injured workers returning to work may require their work patterns to be modified.

- **Warming up and stretching prior to manual handling**

Performing a general warm up and stretches may be beneficial to prevent manual handling injuries. These should be carried out, where and when appropriate, before the object is shifted. The level of warm up and stretching would depend on the individual's personal factors, such as age, physical dimensions and any disabilities the person may have.

Question 3**What are the manual handling training needs?**

Two types of manual handling training are needed.

- **General training**

When should general training in manual handling take place?

- (a) during induction training; and
- (b) as part of an on-going manual handling risk control program.

Who should attend?

Everyone involved in organising and implementing manual handling processes or tasks where hazards have been identified.

Elements of training

The level of training provided should be comparable to the risk involved. Any training should focus on the specific problems identified in the assessment process. Depending on the degree of risk, participants should have an understanding of some or all of the following:

- key sections of the Regulations relating to manual handling and this code of practice;
- the role and responsibilities of the employer, employees and others, and the consultation which should take place between employer and employees in order to identify manual handling hazards, and to assess and control risks;
- the activities included in manual handling, and the types of injuries that can result;
- basic function of the spine, body postures, types of muscle work, and principles of levers;
- the relationship between the human body and risk of manual handling injury;
- the risk management approach to manual handling; and
- the application of relevant control strategies.

- **Task specific training**

When should task specific training take place?

- (a) during induction to the task;
- (b) as part of refresher training; and
- (c) when work tasks are about to be changed or introduced.

Who should attend?

Employees and self employed persons required to undertake the task.

Results of training

After training, participants should be able to:

- recognise manual handling risks in the tasks, and in consultation decide the best way to minimise them;
- carry out manual handling tasks according to a defined safe procedure;
- use relevant mechanical aids;
- use team lifting techniques and know how to minimise associated risks; and
- use personal protective equipment.

4.3 FINDING SOLUTIONS - PUTTING IN CONTROLS

Some solutions may have application in other areas. Both the cost and the benefit of changes can then be shared.

Easy solutions which are available and practicable should be implemented immediately regardless of the task priority. An action plan can also be useful. This could include short term (up to four weeks), medium term (four weeks to six months), or long term (more than six months) strategies. Solutions for each activity, listed in the *Risk Control Form* in Appendix F, should be given a time frame for completion by entering the “By When” column for the agreed control.

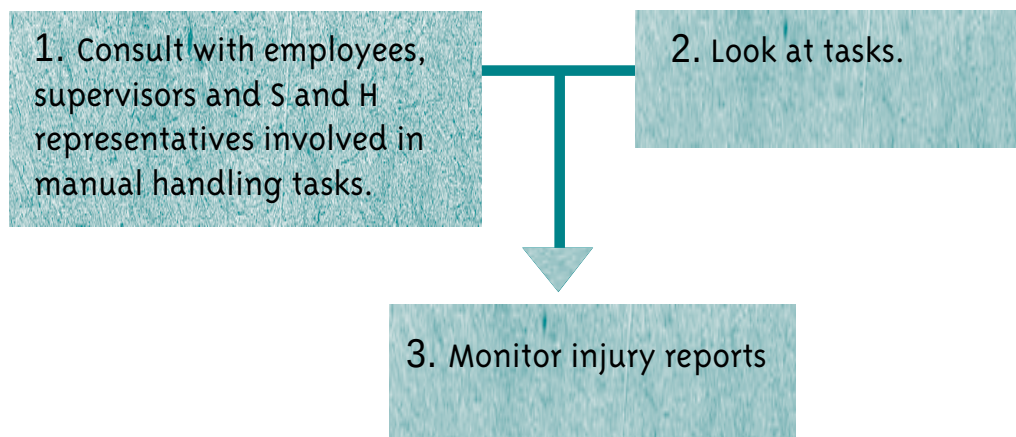
4.4 WHERE TO FROM HERE?

You have now agreed on the strategies required to adequately control the manual handling risks in your workplace. Once you have determined which control strategies will be implemented immediately, and an appropriate action plan for longer term implementation, you can proceed to Follow-Up.

5. FOLLOW-UP

5.1 WHAT IS INVOLVED?

Follow-up is an important consideration to support the risk management plan. It involves finding out whether the changes made have eliminated or reduced the assessed risks, and whether control strategies are continuing to be effective.



5.2 THREE STAGES OF FOLLOW-UP

The follow-up can be carried out after the risk control strategies have been completed (see Appendix D).

The follow-up may involve:

1 Consult with employees, supervisors and safety and health representatives involved in manual handling tasks

It is important to ask a range of employees, so that different levels of experience and physical characteristics are taken into account:

- if the controlled manual handling task or activity is resulting in reduced physical strain or difficulty;
- where controls have resulted in any new problems; and
- where controls have made worse any existing problems.

2 Look at tasks

- observe each changed activity to determine whether the initial risk factors have been minimised as intended; and
- assess the changes to ensure that no new hazards have been introduced. Apply the checklist for risks (see Appendix E) associated with manual handling injury.

3 Monitor injury reports

- monitor accident reports to ensure problems have been resolved;
- check whether control strategies have been used; and
- analyse injury data for any new trends in manual handling injury.

Once follow-up information is obtained, the following questions can be answered:

- Are control strategies operating effectively?
- Are new strategies now available to be applied?
- Is further risk assessment necessary?

Employers and supervisors need to be kept informed of new technology, industry standards and guidelines for reducing manual handling risks.

If new problems have occurred, or if there has been change to the work requirements or equipment used, then further risk assessment (Step 2) may be required.

6. FURTHER INFORMATION

WorkSafe Western Australia

A range of publications related to manual handling can be found on WorkSafe Western Australia's Internet Service SafetyLine: Online [www.safetyline.wa.gov.au]. These include "Safetyline Essentials" as well as a number of industry specific publications (eg. meat industry, nursing homes, retail industry).

Other publications not readily available in Western Australia, which provide manual handling solutions, can be found through the "OSH Links" in SafetyLine: Online.

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Tel. (08) 9327 8777
Fax. (08) 9321 8973
Internet: www.safetyline.wa.gov.au

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1st floor
469 Wellington Street
Perth 6000
Tel. (08) 9322 4737
Fax. (08) 9481 4412
Free call: 13 2447
Email: infoshop@dofa.gov.au

Additional information and assistance

Information and assistance can be provided by:

- Chamber of Commerce and Industry of Western Australia
180 Hay Street
EAST PERTH WA 6004
Tel. (08) 9365 7555
Fax. (08) 9365 7550
Internet: www.cciwa.com
- UnionsWA
Level 4, Unity House
79 Stirling Street
PERTH WA 6000
Tel. (08) 9328 7877
Fax. (08) 9328 8132
Internet: www.tlcwa.org.au

APPENDIX A

GENERAL PRINCIPLES FOR MANAGING OCCUPATIONAL SAFETY AND HEALTH IN WORKPLACES

1.1 LEGISLATIVE FRAMEWORK IN WESTERN AUSTRALIA

The *Occupational Safety and Health Act* sets objectives to promote and improve occupational safety and health standards. The Act sets out broad duties and is supported by more detailed requirements in the *Occupational Safety and Health Regulations*. The legislation is further supported by guidance material such as approved Codes of Practice. This legislative framework is depicted below.

OCCUPATIONAL SAFETY AND HEALTH ACT

Major provisions:

The General Duties

- Resolution of Issues
- Safety and Health Representatives
- Safety and Health Committees
- Enforcement of Act and Regulations

supported by

OCCUPATIONAL SAFETY AND HEALTH REGULATIONS

The Occupational Safety and Health Regulations set minimum requirements for specific hazards and work practices, including reference to National Standards developed by the National Occupational Health and Safety Commission and Australian Standards developed by Standards Australia.

and

GUIDANCE MATERIAL

- Codes of Practice approved for Western Australia in accordance with Section 57 of the Act.
- Guidance Notes developed by the WorkSafe Western Australia Commission.
- National Codes of Practice and National Standards developed by the National Occupational Health and Safety Commission.
- Australian Standards developed by Standards Australia.

1.2 ACCESS TO ACT, REGULATIONS AND OTHER RELEVANT DOCUMENTS

Employers are required to provide information to employees, to alert them to areas where hazards may exist and to improve their understanding of safe work practices. Regulations specify documents which must be made available for perusal by employees at the workplace.

1.3 THE GENERAL DUTIES – AN OVERVIEW

The Act contains general duties which describe the responsibilities of people who affect safety and health at work. Employers must, so far as is practicable,

- provide a workplace and safe system of work so that, as far as practicable, employees are not exposed to hazards;
- provide employees with information, instruction, training and supervision to allow them to work in a safe manner;
- consult and co-operate with safety and health representatives in matters related to safety and health at work;
- provide adequate protective clothing and equipment where hazards cannot be eliminated; and
- ensure plant is installed or erected so it can be used safely.

Employees must take reasonable care to ensure their own safety and health at work and the safety and health of others affected by their work.

Self-employed persons also must take reasonable care to ensure their own safety and health at work and, as far as practicable, ensure the work does not affect the safety and health of others.

Designers, manufacturers, importers and suppliers of plant must ensure that the plant is safe to install, maintain and use at workplaces. Safety and health information must be supplied with all plant and substances used at work.

Designers or builders of a building or structure for use as a workplace must ensure, so far as is practicable, that persons constructing, maintaining, repairing, servicing or using the building or structure are not exposed to hazards.

1.4 HAZARD IDENTIFICATION, RISK ASSESSMENT AND RISK CONTROL

Under Section 19(1)(a) of the *Occupational Safety and Health Act*, employers have a duty to ensure, as far as practicable, that employees are not exposed to hazards at the workplace. The *Regulations* require employers to identify hazards, and assess and control risks.

The regulation outlines three basic steps:

- **Identification of hazards**
This involves recognising things which may cause injury or harm to the health of a person, for instance flammable material, ignition sources or unguarded machinery.
- **Assessing risk**
This involves looking at the possibility of injury or harm occurring to a person if exposed to a hazard.
- **Controlling the risk of injury or harm**
This involves introducing measures to eliminate or reduce the risk of a person being injured or harmed.

It is important to regularly review these steps, especially if there are changes in the work environment, new technology is introduced, or standards are changed.

Employers should consult with safety and health representatives, if any, and employees during these steps.

1.4.1 Identifying hazards

There are a number of ways of identifying potential sources of injury or disease. Selection of the appropriate procedure will depend on the type of work processes and hazards involved.

Procedures may range from a simple checklist for a specific piece of equipment or substance to a more open-ended appraisal of a group of related work processes. A combination of methods may provide the most effective results.

Methods of identifying workplace hazards include:

- developing a hazard checklist;
- conducting walk-through surveys;
- reviewing information from designers or manufacturers;
- analysing unsafe incidents, accident and injury data;
- analysing work processes;
- consulting with employees;
- examining and considering material safety data sheets and product labels; and
- seeking advice from specialist practitioners and representatives.

Some hazards such as mechanical hazards, noise, or the toxic properties of substances are inherent in the work process. Other hazards result from equipment or machine failures and misuse, control or power system failures, chemical spills, and structural failures.

Under Regulation 3.5 of the *Occupational Safety and Health Regulations*, employers have a duty to investigate hazards and injuries that are reported to them. It is important that recording systems be in

place for details of hazard and injury investigations. These records will provide valuable information for identifying hazards and assessing risks.

The following table lists some types of hazards and some specific examples.

TABLE 1

HAZARD	EXAMPLES	OUTCOMES (examples of injury or harm)
Manual handling	overexertion/repetitive movement	sprains, strains, fractures
Falls	falling objects, falls, slips and trips of people	fractures, bruises, lacerations, dislocations, concussion, permanent or fatal injuries
Electricity	electrical current, lightning	shock, burns, electrocution
Machinery and equipment	being hit, hitting objects, being caught in or between, over-turning vehicles	cuts, bruises, dislocations, fractures, amputation, permanent or fatal injuries
Hazardous substances	chemicals such as acids, hydrocarbons, heavy metals	toxic effects, dermatitis, respiratory illnesses, cancers
Extremes of temperature	effects of heat or cold	burns, frost bite, heat stress, heat stroke
Noise	excessive noise	permanent hearing damage
Radiation	ultra violet, welding arc flashes, micro waves, lasers	burns, cancer, damaged eye sight, blindness
Biological	viruses, bacteria, fungi, toxins	Hepatitis, Legionnaire's disease, Q Fever, tetanus, HIV/AIDS, allergies
Vibration	hands and whole of body	organ, nerve and muscle damage
Psychological stress	intimidation, organisational change, violence, conflict, time pressure	high blood pressure, headaches and migraine, anxiety, depression, absenteeism

1.4.2 Analysing and assessing risks

Risk assessment of the hazards identified in the first step should result in a list of potential injuries or harm and the likelihood of these occurring. The potential for fatal injury should be considered for each identified hazard. If hazards are listed they should be in the order of the most to the least serious, eg. from fatal to minor injury.

In assessing risks, consideration should be given to the state of knowledge about the frequency of injury or disease, the duration of exposure to injury or disease sources and the likely severity of the outcomes. Knowledge gained from similar workplaces or similar processes may be relevant to this risk assessment. Items to be considered include:

- **frequency of injury** - how often is the hazard likely to result in an injury or disease?
- **duration of exposure** - how long is the employee exposed to the hazard?
- **outcome** - what are the consequences or potential severity of injury?

Assessing these three factors will indicate the probability or likelihood of injury or harm occurring to workers involved in a particular work process. It also indicates the likely severity of this harm.

Risk assessment requires good judgement and awareness of the potential risks of a work process. Any person undertaking the risk assessment must have knowledge and experience of the work process. The task may be complicated by incomplete data or incomplete information regarding hazards of a work process.

In some cases it may be necessary to break down the activity or process into a series of parts and assess each part separately.

Risk assessment should include:

- assessing the adequacy of training or knowledge required to work safely;
- looking at the way the jobs are performed;
- looking at the way work is organised;
- determining the size and layout of the workplace;
- assessing the number and movement of all people on the site;
- determining the type of operation to be performed;
- determining the type of machinery and plant to be used;
- examining procedures for an emergency (eg. accident, fire and rescue); and
- looking at the storage and handling of all materials and substances.

This step should provide information where and which employees are likely to be at risk of incurring injury or disease, how often this is likely to occur, and the potential severity of that injury or disease risk.

1.4.3 Identifying control measures

The final step in risk assessment is to determine the control measures that need to be taken and the ongoing review of those measures. There is a hierarchy or preferred order of control measures ranging from the most effective to the least effective. The preferred order is outlined in the table below.

The control of occupational injury and disease risks should preferably be dealt with by design, substitution, redesign, separation or administration. These controls generally eliminate, reduce or minimise risk in a more reliable manner than personal protective equipment.

Controls involve implementing measures which reduce the hazard and risk in the workplace.

Where regulations require specific methods to control the risk, these must be complied with.

TABLE 2 - HIERARCHY OR PREFERRED ORDER OF CONTROL

elimination - removing the hazard or hazardous work practice from the workplace. This is the most effective control measure;

substitution - substituting or replacing a hazard or hazardous work practice with a less hazardous one;

isolation - isolating or separating the hazard or hazardous work practice from people involved in the work or people in the general work areas from the hazard. This can be done by installing screens or barriers or marking off hazardous areas;

engineering control - if the hazard cannot be eliminated, substituted or isolated, an engineering control is the next preferred measure. This may include modifications to tools or equipment, providing guarding to machinery or equipment;

administrative control - includes introducing work practices that reduce the risk. This could include limiting the amount of time a person is exposed to a particular hazard; and

personal protective equipment - should be considered only when other control measures are not practicable or to increase protection.

Control measures are not mutually exclusive. That is, there may be circumstances where more than one control measure should be used to reduce exposure to hazards.

In some instances, a combination of control measures may be appropriate. Control measures should be designed:

- to eliminate or reduce the risks of a hazardous work process and to minimise the effects of injury or disease; and
- to reduce the risk of exposure to a hazardous substance.

1.5 THE MEANING OF PRACTICABLE

Some of the general duty provisions in the Act and some requirements in the Regulations are qualified by the words “so far as is practicable”.

“Practicability” applies to general duties for employers, self-employed people, people with control of workplaces, designers, manufacturers, importers, suppliers, erectors and installers, and to certain requirements in the Regulations.

These people are expected to take practicable and reasonable measures to comply with the requirements.

If something is practicable, it is capable of being done. Whether it is also reasonable takes into account:

- the severity of any injury or harm to health that may occur;
- the degree of risk (or likelihood) of that injury or harm occurring;
- how much is known about the hazard and the ways of reducing, eliminating or controlling it; and
- the availability, suitability and cost of the safeguards.

The risk and severity of injury must be weighed up against the overall cost and feasibility of the safeguards needed to remove the risk.

Common practice and knowledge throughout the relevant industry are taken into account when judging whether a safeguard is “reasonably practicable”. Individual employers could not claim that they did not know what to do about certain hazards if those hazards are widely known by others in the same industry, and safeguards were available.

The cost of putting safeguards in place is measured against the consequences of failing to do so. It is not a measure of whether the employer can afford to put the necessary safeguards in place.

In some instances, a combination of control measures may be appropriate. Control measures should be designed:

- to eliminate or reduce the risks of a hazardous work process and to minimise the effects of injury or disease; and
- to reduce the risk of exposure to a hazardous substance.

While cost is a factor, it is not an excuse for failing to provide appropriate safeguards, particularly where there is risk of serious, or frequent but less severe, injury.

Where a regulation exists and is not qualified by the words “as far as is practicable”, the regulation must be complied with as a minimum requirement.

The WorkSafe Western Australia Commission Guidance Note *The General Duty of Care in Western Australian Workplaces* provides detailed information on the ‘duty of care’. The Guidance Note can be purchased from WorkSafe Western Australia, Westcentre, 1260 Hay Street, West Perth [Tel. (08) 9327 8777] or can be downloaded from Safetyline Online [www.safetyline.wa.gov.au].

APPENDIX B

ACCIDENT REPORTING

1.1 ACCIDENT AND INJURY REPORTING

Accident reporting systems should collect information such as the equipment used, the injury involved, the part of body injured and how the injury was caused. Guidance on what information should be collected on each injury can be found in *AS 1885.1 Describing and reporting occupational injuries and disease*.

Manual handling should be recorded as a cause of injury. The ‘cause of injury’ information is usually referred to as the “Mechanism of Injury”. Within this category of information, manual handling as a cause of injury, is usually referred to as either:

- repetitive movement with low muscle loading (this refers to Repetitive Strain Injury and Occupational Overuse Syndrome); or
- other muscular stress (this refers to injuries resulting from lifting, lowering, carrying, pushing and pulling).

1.2 USING WORKERS’ COMPENSATION CLAIM INFORMATION

Another useful source of information is workers’ compensation claims. Your insurance company should be able to provide a detailed breakdown of all work related workers’ compensation claims by “Mechanism of Injury” for your workplace. Insurance companies are required to use a detailed system for recording information (referred to as the “Type of Occurrence Classification System”) on claims. In this system, manual handling is referred to as ‘body stressing’ and is split into 3 types relevant to manual handling:

- muscular stress while lifting, carrying or putting down;
- muscular stress while handling objects other than lifting, carrying or putting down (this includes pushing, pulling); and
- repetitive movement, low muscle loading (this refers to Repetitive Strain Injury and Occupational Overuse Syndrome).

Details of the trends and characteristics of manual handling injuries in Western Australia can be found in the “Work Safety and Health Statistics” section of Safetyline.

APPENDIX C

MANUAL HANDLING HAZARD IDENTIFICATION FORM

The text at section 2.2 refers to this Form

DEPARTMENT/ SECTION	OCCUPATION	LOCATION	TASK PERFORMED	MANUAL HANDLING PROBLEM ASSOCIATED WITH TASK INJURY	(ONLY COMPLETE IF INJURY HAS OCCURRED)

MANUAL HANDLING HAZARD IDENTIFICATION FORM: EXAMPLE

DEPARTMENT/ SECTION	OCCUPATION	LOCATION	TASK PERFORMED	MANUAL HANDLING PROBLEM ASSOCIATED WITH TASK INJURY	(ONLY COMPLETE IF INJURY HAS OCCURRED)
Maintenance	mechanic	Depot	climbing onto back of truck		twisted back
Maintenance	mechanic	Depot	lifting machine off truck *		back strain
Maintenance	mechanic	Depot	lifting machine off truck *	difficult to reach and awkward to handle	none
Engineering	grano worker	Villeneuve Road	lifting paving slabs		strained back/shoulder
Engineering	grano worker	Nelson Oval	shifting kerbing		back strain
Engineering	driver	DeGrasse Street	lifting plate compactor off truck *	other employee lost grip	back strain
Engineering	labourer	Rodney Avenue	lifting section of power pole		sore shoulder
Engineering	driver	Campbell Street	pulling traffic signs off truck *		shoulder strain
Engineering	grano worker	Camperdown Rd	stacking witches hats on truck *		upper back strain
Engineering	concretor	H. Hall Autumn Centre	using compactor	stumbled on uneven ground	lower back strain
Engineering	labourer	Victory Road	carrying gas bottle	difficult to handle and heavy	wrenched back
Engineering	labourer	Various	lifting plate compactor off truck *		none
Parks & Gardens	gardener	Nelson Oval	breaking ground with pinch bar		sore arms
Parks & Gardens	gardener	Sovereign Park	feeding prunings into wood chipper		sore arms

*common activity

APPENDIX D

ACTION PLAN FORM

AREA OF WORKPLACE

MANUAL HANDLING TASK OR ACTIVITY

DESCRIPTION OF TASK OR ACTIVITY

ASSESSED BY

Name

Position

RISK ASSESSMENT

RISK CONTROL

Short term

Medium term

Long term

Start date

Anticipated date for completion

Completion date

FOLLOW-UP

ACTION PLAN FORM: EXAMPLE

AREA OF WORKPLACE

Road Maintenance Truck

MANUAL HANDLING TASK OR ACTIVITY

Loading and unloading things from truck.

DESCRIPTION OF TASK OR ACTIVITY

*Loading and unloading compactor, traffic signs, sledge hammers, pinch bars, witches**hats etc. Items stowed anywhere. Witches hats (light) usually kept close to edge of truck, heavy items usually kept near centre and difficult to reach.*

ASSESSED BY

Name

*Bill Ruffin**Mary Jackson*

Position

*Supervisor**Safety & health representative*

		Start date	Anticipated date for completion	Completion date
RISK ASSESSMENT RISK CONTROL		<i>February</i>	<i>March</i>	<i>March</i>
	Short term	<i>April</i>	<i>April</i>	<i>April</i>
	Medium term	<i>May</i>	<i>July</i>	<i>On-going</i>
	Long term	<i>Feb next year</i>		
FOLLOW-UP		<i>August</i>	<i>September</i>	

APPENDIX E

RISK ASSESSMENT FORM

RISK FACTORS TO CONSIDER (Use the information in Appendix H to fill in this form)	LEVEL OF RISK (Tick as appropriate)				COMMENT (Make notes on reasons for your judgment on level of risk)
	Not Applic	Low	Med	High	
Do the actions and posture involve: • holding loads away from trunk; • reaching upwards or load handling above shoulder height; • bending forward or handling below mid-thigh height; • twisting; • sideways bending or load handling by one hand; • long carrying distances; • strenuous pushing or pulling; or • sudden jerky movements?					
Are the loads: • heavy; • bulky, large or awkward; • difficult to grasp; • unstable or unpredictable; • intrinsically harmful; or • a person or animal?					
Are there in the work environment: • constraints on posture; • rough or slippery floors; • variations in levels; • adverse climatic conditions eg. wind, cold or heat; or • poor lighting?					
Does the job: • involve young persons; • involve staff who are pregnant; • involve staff with special needs; • require special skills, capabilities or knowledge; or • require protective clothing or equipment to be worn?					

RISK ASSESSMENT FORM: EXAMPLE

RISK FACTORS TO CONSIDER (Use the information in Appendix H to fill in this form)	LEVEL OF RISK (Tick as appropriate)				COMMENT (Make notes on reasons for your judgment on level of risk)
	Not Applic	Low	Med	High	
Do the actions and posture involve: - holding loads away from trunk; - reaching upwards or load handling above shoulder height; - bending forward or handling below mid-thigh height; - twisting; - sideways bending or load handling by one hand; - long carrying distances; - strenuous pushing or pulling; or - sudden jerky movements?	✓		✓	✓	Comments refer to items kept on truck <i>must stretch to get sledge hammer poles on top racks</i> <i>gas bottle, front of compactor</i> <i>traffic signs</i> <i>compactor</i>
Are the loads: - heavy; - bulky, large or awkward; - difficult to grasp; - unstable or unpredictable; - intrinsically harmful; or - a person or animal?	✓		✓	✓	<i>compactor</i> <i>traffic signs</i> <i>compactor</i> <i>cement bags</i>
Are there in the work environment: - constraints on posture; - rough or slippery floors; - variations in levels; - adverse climatic conditions eg. wind, cold or heat; or - poor lighting?	✓		✓		<i>ground in some areas</i>
Does the job: - involve young persons; - involve staff who are pregnant; - involve staff with special needs; - require special skills, capabilities or knowledge; or - require protective clothing or equipment to be worn?	✓		✓		<i>2 staff have old back injuries</i>

APPENDIX F

RISK CONTROL FORM

CONTROL OPTIONS	AGREED CONTROL STRATEGY	BY WHEN	IMPLEMENTED (Date when completed)

RISK CONTROL FORM: EXAMPLE

CONTROL OPTIONS	AGREED CONTROL STRATEGY	BY WHEN	IMPLEMENTED (Date when completed)
<i>Re-arrange how things stowed on truck</i>	✓	<i>Immediate</i>	<i>March</i>
<i>Inform employees of agreed changes</i>	✓	<i>Immediate</i>	
<i>Fix step onto top of tailgate (for use when tailgate lowered)</i>	✓	<i>April</i>	
<i>Install hand winch for use with compactor</i>	✓	<i>July</i>	
<i>Store poles underneath truck</i>	✓	<i>May</i>	
<i>Replace metal traffic signs with canvas ones</i>	✓	<i>Feb next year</i>	
<i>Buy new truck</i>	X		

APPENDIX G

FOLLOW-UP FORM

FOLLOW-UP

1. Are implemented changes operating effectively? Yes ☐ No ☐

If NO, what action is to be taken to ensure their effective implementation?

2. Have the implemented changes reduced risk of injury? Yes ☐ No ☐
(ie., fewer injuries and reports of physical strain)

If NO, what further modifications are to be implemented?

3. Have new risks of injury been introduced? Yes ☐ No ☐

If YES, how will these new risks be controlled?

4. Are new solutions available that can now be applied? Yes ☐ No ☐

If YES, what action is to be taken to implement these solutions?

5. Is a new risk assessment necessary? Yes ☐ No ☐

If YES, specify when and by whom.

RISK CONTROL FORM: EXAMPLE

FOLLOW-UP

1. Are implemented changes operating effectively? Yes ☐ No ☒

If NO, what action is to be taken to ensure their effective implementation?

*Ensure all employees are informed of the agreed control strategies. Need to fit racks on truck to ensure items are stored in the preferred locations and not just placed randomly back onto the truck.*_____

2. Have the implemented changes reduced risk of injury? Yes ☐ No ☒
(ie., fewer injuries and reports of physical strain)

If NO, what further modifications are to be implemented?

*Still have some verbal reports of difficulty getting items off the truck - but this is because they have not been put back into the assigned places. Inform all employees of preferred locations for storage of items.*_____

3. Have new risks of injury been introduced? Yes ☐ No ☒

If YES, how will these new risks be controlled?

4. Are new solutions available that can now be applied? Yes ☒ No ☐

If YES, what action is to be taken to implement these solutions?

*Label locations where items are to be stored on the truck.*_____

5. Is a new risk assessment necessary? Yes ☐ No ☒

If YES, specify when and by whom.

APPENDIX H

GUIDANCE MATERIAL FOR RATING RISK FACTORS

Use this information to assist in filling out the Risk Assessment Form (Appendix E)

1. ACTIONS AND POSTURE

This section reviews actions and postures used during manual handling activity.

When assessing the risk of injury from each factor in this section, the overall rating should take into account the effect of:

- how often the load is handled; and
- how long the load is handled.

1.1 Holding loads away from the trunk

The risk of injury increases as the load is held further away from the front of the body.

Holding a load at arm's length imposes about five times the strain experienced when holding the same load very close to the body.

Picking up a load further away from the body can mean the handling of the object is not controlled.

Accurately placing the load further away from the body will tire the muscles holding the load, due to the need for more careful control over its movement.

1.2 Reaching upwards and handling a load above shoulder height

The risk of injury increases the higher the load is above shoulder height.

To reach above shoulder height means the back is arched, and arms are acting as long levers. The load is more difficult to control.

Lowering from this level to a level below mid-thigh height can require a change of grip.

1.3 Bending forward and handling the load below mid-thigh height

The risk of injury increases the closer the load is to the ground.

Bending forward to pick up loads from a low level creates strain, particularly on the lower back.

1.4 Twisting

The risk of injury increases with the degree of body twist.

The back is least able to take the stress caused by excessive twisting in repeated movements or prolonged posture. The combination of twisting and bending forward to handle a load represents significant risk.

1.5 Sideways bending and load handling with one hand

The risk of injury increases with the degree of sideways bending to handle a load.

Lifting and carrying loads in one hand places more stress on the side of the body.

1.6 Long carrying distances

The risk of injury increases with distance the load is carried.

Carrying a load for an excessive distance increases muscle fatigue, particularly in the arms. This can affect an individual's ability to carry out other handling activities afterwards.

1.7 Strenuous pushing and pulling

The risk of injury increases as the amount of force required to push and pull becomes greater.

Initial forces to move an object are greater and involve higher risk than those required to keep an object moving. Pushing and pulling across the front of the body puts a twisting strain on the body which can lead to an increased risk of injury.

1.8 Sudden or jerky movements.

The risk of injury increases with the amount of force used.

Sudden or jerky movements can place unexpected loads on backs which aren't prepared. For example, when a gardener jerks a heavy bag of potting mix or fertilizer on to a shoulder, or when a cleaner pulls a stuck vacuum cleaner cord and it comes away suddenly.

When any dimension is more than 75 cm a greater risk is incurred. This risk is higher again if two dimensions are more than 75 cm.

A large load may also block the view, when carried, and increase the chance of a person tripping.

2. THE LOAD

This section looks at factors related to the characteristics of the load.

2.1 Heavy

The risk of injury increases as the weight of a load increases.

Evaluating the risk of weight of the object needs to take into account:

- how long the load is handled; and
- how often the load is handled.

As a guide, the risk of back injury increases when loads over 4.5 kg are handled from a seated position or when loads over 16 kg are handled from positions other than seated. As weight increases, the percentage of healthy adults who can safely lift, lower or carry decreases.

Generally, no single person should be required to lift, lower or carry loads over 55 kg. **THIS LIMIT WOULD ONLY APPLY, HOWEVER, WHEN THE LOAD IS WITHIN THE PERSON'S CAPABILITIES AND NO OTHER RISK FACTORS ARE PRESENT** (eg. no bending or twisting is required to pick up the load; the load is compact and easy to grasp; it is held close to the trunk and not carried frequently or for long distances).

On occasions, objects over 55 kg may be moved but not lifted, eg. rolling a 200 litre drum.

2.2 Bulky, large or awkward

The risk of injury increases as the size of the load becomes larger.

The shape of the load can affect the way it can be held. For example, the risk of injury will be greater if a load has to be lifted from the ground and is wider than the distance between the knees.

Where a load's width (measured across the body) is more than 50 cm, there is an increased risk.

2.3 Difficult to grasp

The risk of injury increases with the lack of safe handholds on a load.

Loads become more difficult to grip when they are smooth, slippery, greasy or wet. Extra grip strength will be needed to hold a load. This will be tiring for the person, and will increase the chance of the load being dropped.

The absence of handholds due to awkward shape, or handholds in a difficult position, will affect a person's ability to hold the load.

2.4 Unstable and unpredictable

The risk of injury increases with the level of instability and unpredictability.

Loads with shifting contents, (eg. drums half full of liquid), make control of the load more difficult, and leads to sudden additional body stresses for which the person may not be fully prepared.

A load where one side or one part is heavier than others will cause uneven muscular strain. This will be worse if the heavier part cannot be carried close to the body.

2.5 Intrinsically harmful

The risk of injury increases with:

- the sharpness or roughness of the load;
- hot or cold surface temperatures.

These factors may cause injury, eg. cuts or burns arising from the external state of the load. They may also impair grip and discourage good posture.

2.6 Handling a person or animal

The risk of injury increases in relation to the unpredictable actions of the person or animal being handled.

Handling persons who cannot assist, are unable to bear weight, or are unco-operative, will increase the risk of injury. Live animals being lifted or restrained may suddenly move or pull away, placing extra stress on the back.

3. THE WORK ENVIRONMENT

This section examines the influence of the work environment on the risk of manual handling injury.

3.1 Constraints on posture

The risk of injury increases in relation to space constraints in handling.

For space constraint to be a risk, it needs to impose a restriction on a person's handling ability. Restricted head room will promote a stooping posture, obstructions may increase the need for twisting or leaning, and narrow gangways will hinder manoeuvring of bulky loads.

3.2 Rough or slippery floors

The risk of injury increases with greater degrees of floor slipperiness or unevenness.

3.3 Variations in levels

The risk of injury increases with greater differences in floor level.

The presence of steps or steep slopes adds to the difficulty of movement when handling loads, particularly when the load obscures a person's view.

Carrying a load up or down a ladder will be difficult due to the need to have a proper hold on the ladder.

3.4 Adverse climatic conditions

The risk of injury increases with higher temperatures and humidity, colder temperatures or windy conditions.

Higher temperature and humidity increase the total physical load on the body, which leads to more rapid fatigue. Perspiration on the hands may reduce gripping ability.

Cold, windy conditions, particularly in the first part of the work period, may prevent muscles being properly warmed up. Handling roof sheeting in cold windy conditions increases the risk of injury.

3.5 Poor lighting

The risk of injury increases with lower levels of light or higher levels of glare.

Low levels of light or high contrast between areas of bright light and deep shadows can aggravate tripping hazards. Concentration on the task may be reduced.

4. CHARACTERISTICS OF THE EMPLOYEE

This section relates to risk factors related to the person(s) doing the handling.

4.1 Young persons

The risk of injury increases for persons aged below 18 years.

Young workers under the age of 18 are at greater risk than adult workers because they are still developing physically and their spine and other joints are more easily damaged. Loads over 16 kg represent significant risk to young workers.

4.2 Pregnant women

The risk of injury increases as pregnancy progresses.

Hormonal changes can affect ligaments, increasing susceptibility to injury. Postural problems may increase as the pregnancy progresses. Difficulty in getting a load close to the body can be a particular problem. Care should also be taken for women who may handle loads following a return to work during the first three months after childbirth.

4.3 Special needs

The risk of injury increases with decreased physical ability.

Employees returning to work after injury may not be able to perform at their normal level of work.

Specific disabilities and illnesses, for example, Scoliosis and Osteoarthritis may affect a person's ability in manual handling.

Staff returning from an extended absence may have reduced level of fitness for physical work.

Occasional heavy manual handling may place extra demands on staff, who normally carry out lighter tasks, like office work.

4.4 Special skills, capabilities and knowledge

The risk of injury may increase where a greater degree of special skills, capabilities and/or knowledge is required.

Some manual handling activities, eg. patient handling, require very specific skills and knowledge to perform.

4.5 Clothing or personal protective equipment (PPE) that hinders movement or posture

The risk of injury may increase from the use of PPE and some types of clothing.

Tight clothing that restricts movement will adversely affect manual handling technique.

Where personal protective equipment must be worn, its effect on injury risk should be considered. For example, gloves may reduce ability to grip loads firmly; the weight of gas cylinders used with breathing apparatus will increase the stresses on the body.

APPENDIX I

REDESIGNING THE WORKPLACE

Further examples of controlling manual handling risks by redesigning the workplace are shown below under the three category headings: Modifying Workplace Layout and Equipment; Modifying the Load; and Controlling the Work Environment.

MODIFYING WORKPLACE LAYOUT AND EQUIPMENT

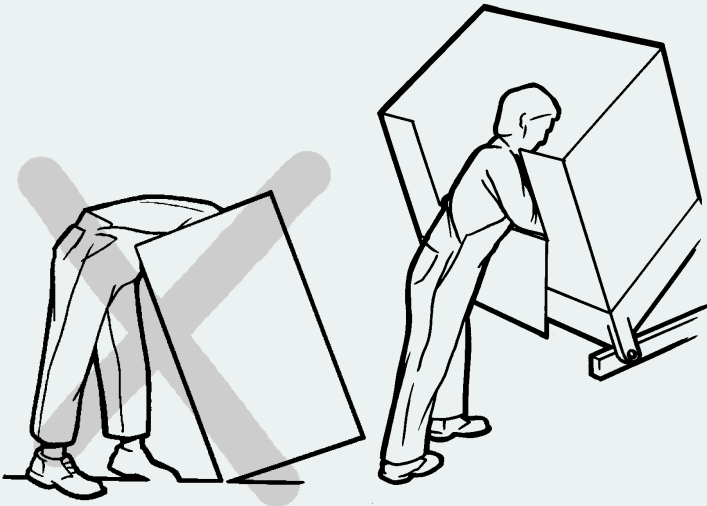


FIGURE 1 - Prevent excessive bending of the back

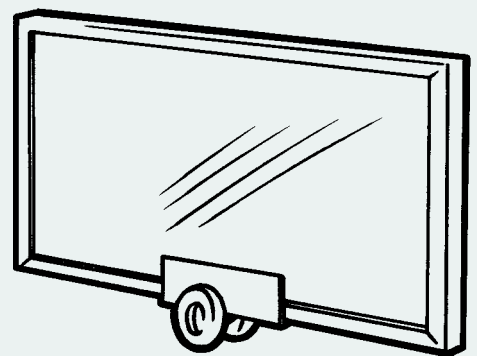


FIGURE 2 - Avoid holding large loads by using a mechanical aid



FIGURE 3 - Reducing twisting by using a pallet turntable

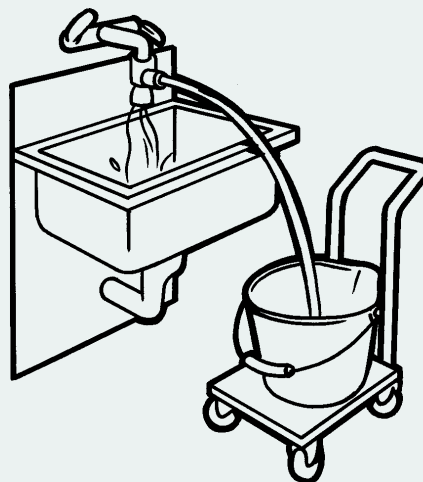


FIGURE 4 - Avoid lifting below mid-thigh height

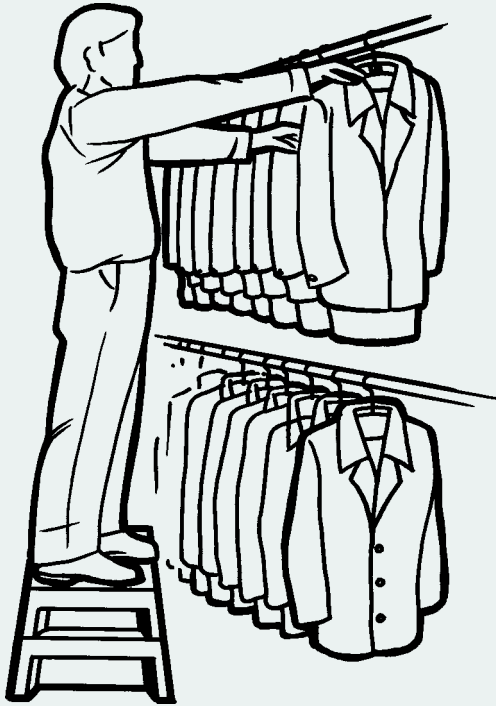


FIGURE 5 - Reduce reaching above shoulder height

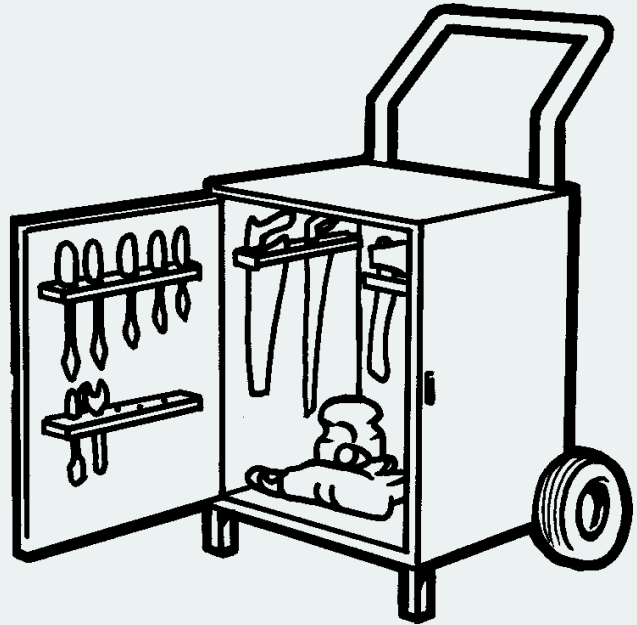
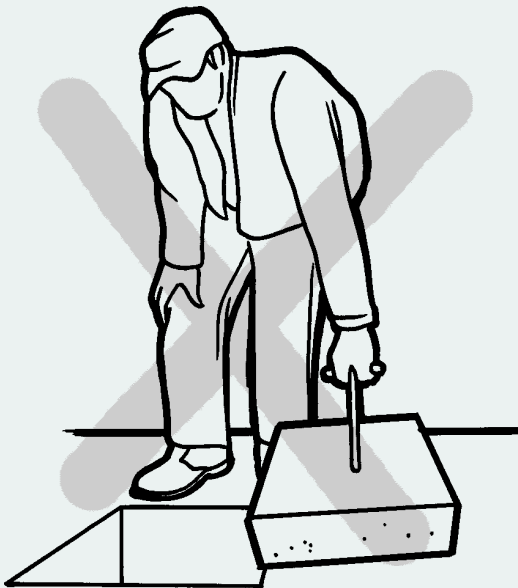


FIGURE 6 - Reduce carrying



Poor



Good

FIGURE 7 - Avoid handling loads with one hand



Small wheels require more force



Large wheels require less force

FIGURE 8 - Use less force

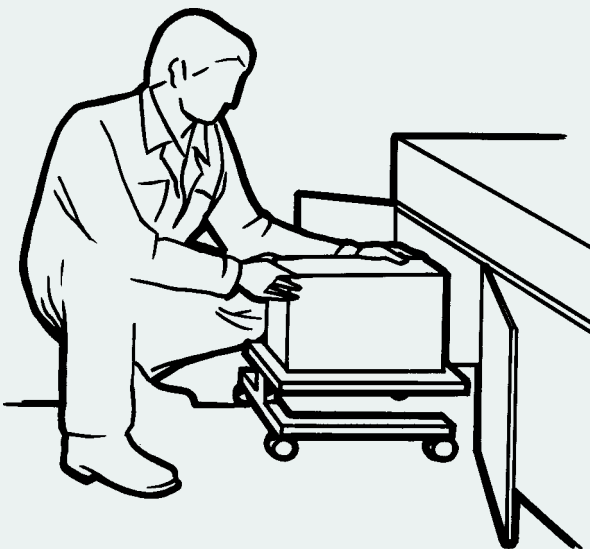


FIGURE 9 - Avoid awkward handling

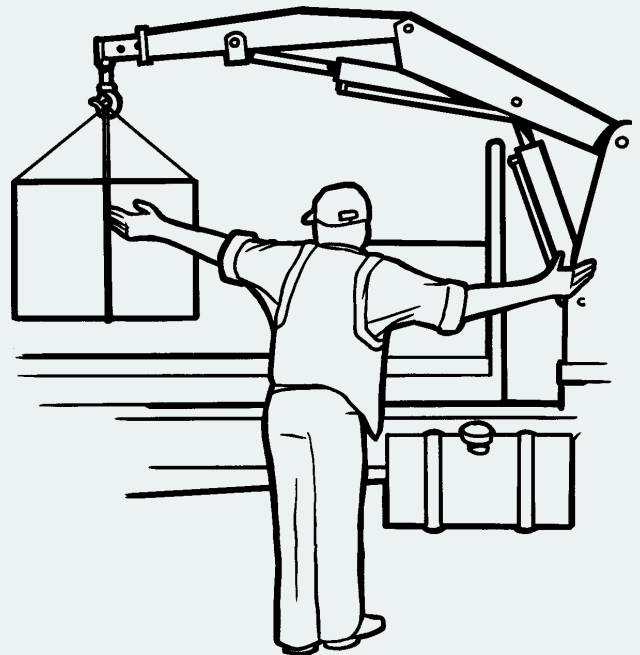


FIGURE 10 - Use lifting devices

MODIFYING THE LOAD

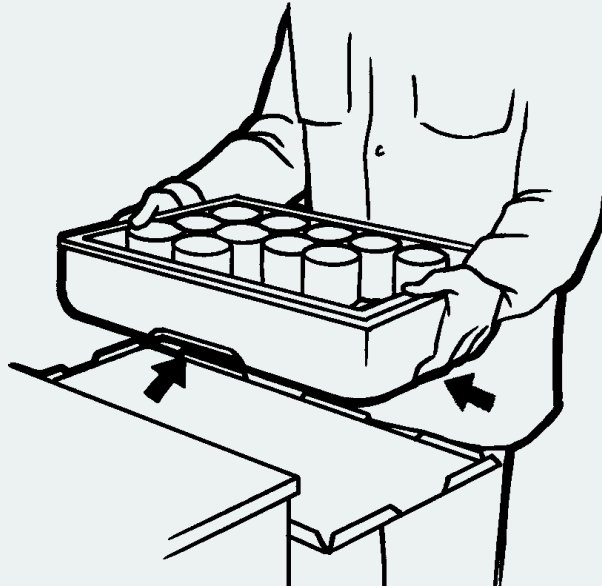
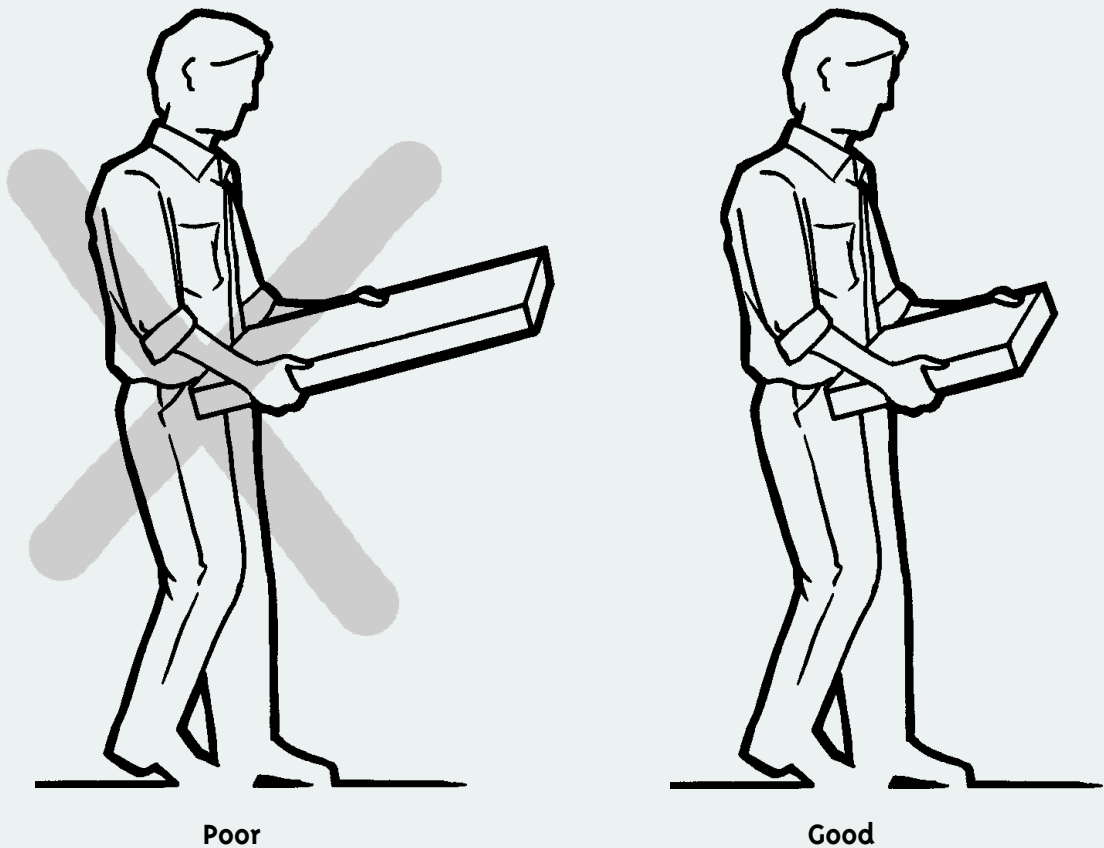


FIGURE 11 - Improve grip



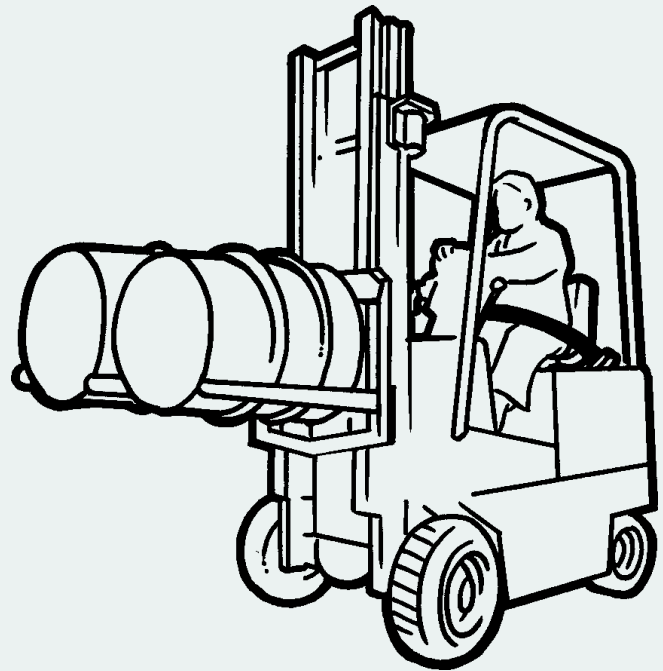
Poor

Good

FIGURE 12 - Change shape to control stability of load.



Handling 60L container manually increases risk



Handling 200L drum mechanically decreases risk

FIGURE 13 - Increase load size and handle mechanically

CONTROLLING THE WORK ENVIRONMENT

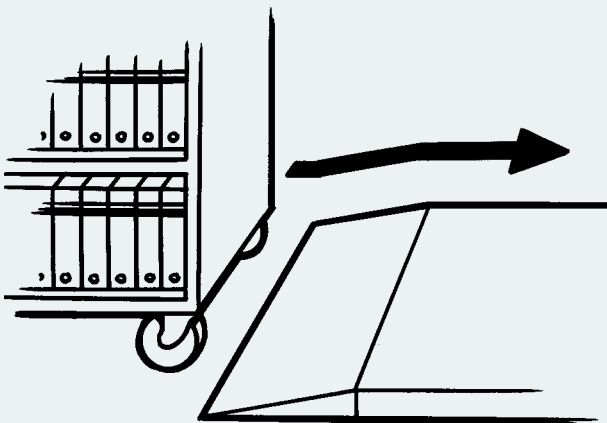


FIGURE 14 - Control variations in floor level



FIGURE 15 - Avoiding slippery surfaces

