



Injury Prevention and Ergonomics Manual

Health & Safety

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1 Purpose and Scope

The purpose of this document is to provide practical guidance to prevent personal injury arising from manual tasks. It covers the prevention, identification, assessment and control of risks and ergonomic requirements within the workplace.

Roy Hill also has an obligation to identify workplace hazards, to assess the associated risks and to make the necessary changes to minimise the risks

This procedure shall apply to all personnel working for Roy Hill, including contractors, and shall extend to the nominated Roy Hill medical practitioners, rehabilitation providers, workers' compensation insurers and insurance broker.

2 Manual Handling

Manual handling refers to any activity or sequence of activities that requires a person to use their physical body (musculoskeletal system) to perform work, and includes:

- Lifting, lowering, or carrying
- Pushing, pulling, throwing or restraining
- Awkward postures (bending, twisting) even when no objects are being handled
- Using plant, tools or equipment that exposes workers to vibration.
- Repetitive movements

A musculoskeletal disorder is an injury or disease of the musculoskeletal system. Musculoskeletal disorders may arise in whole or in part from performing manual tasks, whether it suddenly occurs or over a prolonged period of time.

Musculoskeletal disorders may result from:

- Gradual deterioration caused by frequent or prolonged periods of performing manual tasks;
- Sudden damage caused by intense or strenuous manual handling or awkward lifts, or
- Direct trauma caused by unexpected events.

2.1 Manual Task Risk Management

Performing manual tasks is an essential part of our workplace. Managing those risks to prevent injuries is a three-step process of systematically identifying, assessing and controlling these risks. The three-step process helps to identify hazardous manual tasks, understand the nature of the associated risks and the source of risks, so that we can either eliminate or control the risks to personal injury.

The three-step process should take place:

- Regularly, as part of operations
- When a hazard, injury/ disorder, incident or near miss has been reported in relation to a manual task
- When new manual tasks are being introduced
- When there are changes that influence the way manual tasks are performed (change in environment, equipment, systems of work)

The manual task risk management process ensures that the demands of the task do not exceed the physical capabilities of workers performing the task.

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The three-stage process is briefly outlined below:

First Stage: Hazard Identification

To identify manual handling tasks which are likely to be a health and safety risk:

- Analysis of Workplace Injury and Incident records
- Consult with workers, supervisors, and safety and health professionals
- Direct Observation
- Collect information and look for trends

Second Stage: Risk Assessment

To conduct assessment of risk factors:

- Workplace and workstation layout
- Working posture
- Duration and frequency of the activity
- The amount of force applied to hold a posture
- Work organisation
- Skills and experience
- Individual factors

An assessment of office ergonomics should also be undertaken at this stage.

Third Stage: Risk Control

To identify all practicable measures to eliminate or reduce the likelihood of injury, illness or disease:

- Job design and redesign
- Modify work place layout
- Modify object or equipment
- Maintenance of equipment or plant
- Task-specific (particular) training

2.2 First Stage: Hazard Identification

To manage the associated risk when performing manual tasks, Roy Hill must identify manual tasks that have the potential to cause injury or harm (i.e. identify hazardous manual tasks) so that they may be targeted for further examination and the risks controlled.

Hazard identification is carried out in many ways, some of which are detailed below

2.2.1 Analysis of Injury and Incident Records of the Workplace

Records should be examined to identify where and in what jobs manual handling-related injuries have occurred in the past.

Injury records will include details of the frequency and severity of injuries, the number of hours worked and areas of work.

2.2.2 Consult with Employees

Consult with workers, supervisors and safety and health representatives about whether there are any manual handling risks that they believe:

- may have led to physical strain
- are difficult to do
- are physically demanding
- are of long duration and high intensity

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- or are issues relating to equipment use

2.2.3 Direct Observation

Personal or direct observation whilst 'on the job' will assist in deciding which tasks or jobs require closer observation. This will assist to:

- determine which aspects of the tasks identified pose a risk
- understand how they increase the risk of injury
- determine the source/s of the risk (why the risk factor is present)
- formulate a job role profile

2.2.4 Collation of Information and Trend Analysis

Once all the data or information is collected using the methods outlined above, sort the information so that trends can be identified. Further analysis may highlight which manual handling tasks should take priority for assessment.

Trends or common problems can be categorized into:

- Manual tasks- trends may show that certain manual tasks tend to have a presence of more risk factors than others. This may be associated with the type of activities that must be performed to complete the task in the environment and/or with the equipment provided.
- Jobs or occupations – trends may show risk factors in a range of tasks done by people working in certain jobs or occupations.
- Groups and locations- trends may indicate higher numbers of potentially hazardous manual tasks are being performed in certain groups and locations of the business.
- Types of injuries- trends may highlight that certain injuries are associated with a manual task, job, group, location, or use of certain equipment.
- Worker characteristics- trends may highlight certain groups or individual traits such as age, sex, height, physical ability which may have difficulty performing manual tasks.

2.3 Second Stage Risk Assessment

The second stage in reducing injuries within Roy Hill is to perform a manual handling risk assessment. The risk assessment should consider the following factors:

- Actions and postures involved in doing the task
- The characteristics of the load being handled
- The characteristics of the work environment
- Special considerations of the employees performing the task

2.3.1 Workplace and Workstation Layout

The layout of the workstation, plant and equipment in the workplace may place the employees at an increased risk of injury. The layout of the workplace should be appropriate for the task and matched to the employee. The employee should be able to perform the task without undue difficulty.

Risk factors include:

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Load Characteristics	
Heavy loads	The risk of injury increases as the weight of a load increases.
Bulky or large loads	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. A large load may also reduce visibility and increase the risk of slips and trips.
Awkward loads	The risk of injury increases when there are no safe handholds or when the load is slippery, greasy or wet.
Load Characteristics	
Unstable and unpredictable loads:	Risk of injury increases when the load contents shift during lifting because it makes the load more difficult to control, and may lead to sudden additional body stresses for which the person may not be fully prepared.
Intrinsically harmful loads	Sharp, rough, hot or cold loads increase the risk of injury by causing injury directly (e.g. cuts, burns) or by impairing good posture.
The Work Environment	
Confined areas and small spaces	The risk of injury increases where confined areas and limited space restrict use of correct lifting postures, or cause worker to sustain stooped or awkward postures.
Uneven or slippery floors	Risks of slips, trips and falls increases when the floors / ground is uneven and /or slippery. They also hinder the safe use of trolleys.
Actions and Postures	
Holding loads away from the trunk	Risk of injury increases with increased distance of the load from the body.
Reaching upwards and handling loads above shoulder height	Risk of injury increases the higher the load is above shoulder height. Optimal working height is between hip and shoulder height.
Stooping or handling the load below hip height	Stooping to pick up loads from a low level creates strain, particularly on the lower back. The risk of injury increases the closer the load is to the ground. Optimal working height is between waist and shoulder height.
Twisting	The risk of injury increases with increased body rotation. Prolonged or repetitive twisting or a combination of twisting and stooping represents a significant risk of injury to the lower back.
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 that side of the body.
Carrying over a long distance	Risk of injury increases with the 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.
Characteristics of Worker	
Pregnant worker	The risk of injury increases as pregnancy increases. Hormonal changes affect ligaments and increase susceptibility to injury. There may also be difficulty carrying a load close to the body.
Special needs	The risk of injury increases with the level of physical limitations (e.g. if there is a restricted range of body movement) or reduction in cardiovascular fitness. Specific disabilities and illness (e.g.: scoliosis and Osteoarthritis), though not necessary work related, may affect the person's ability to perform manual handling tasks.

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Special skills, capabilities and knowledge	The risk of injury may increase with greater degrees of special skills, capabilities and knowledge required. Some manual handling activities require specialised training to perform.
Clothing or personal protective equipment that hinders movement:	Tight clothing that restricts movement will adversely affect manual handling techniques. Also, loose clothing may become snagged or caught between or under objects.

2.3.2 Work Posture

It is important to consider the employee's posture in attempting to reduce the risk of injury. The design of the task and the workstation should aim to provide comfortable and varied working postures, particularly when there is a requirement to provide force, exertion, sustained positions, or tasks that are performed for a long period of time or repeatedly within a short time period.

2.3.3 Duration and Frequency of Activity

Muscles are fatigued further when a worker is required to sustain any position for a length of time. When muscles are fatigued there is an increased risk of injury occurring or aggravation of a pre-existing injury, therefore the longer the activity is performed and the more frequent the activity is performed the risk of injury is significantly increased.

2.3.4 Force Applied

The application of force used to move, restrain or hold a posture requires muscular effort. The greater the force that is applied the greater the risk of injury.

2.3.5 Work Organisation

The work place should be designed so that the employee can regulate their tasks, where workable, to meet work demands. The worker should be encouraged to pace themselves throughout the day (e.g. change from sitting to standing, where possible) and undertake regular postural variations throughout their work day.

2.3.6 Skills and Experience

The risk of sustaining an injury during a task increases with task complexity. The greater skills, capabilities and knowledge required to perform the task, the greater the training that should be undertaken for the task. Some manual handling activities require specialised skills and knowledge to perform. Other activities are more difficult when a person's capabilities are compromised, e.g. when a short person has to lift loads on or off high shelving.

2.3.7 Individual Factors

When an employee is away from work, for example, two weeks or more, there may be the need for a period of readjustment to return to previous working capacity. If prolonged absences from work are encountered, Roy Hill employees may be required to undergo a fitness for work assessment and may be placed on a return to work program until a time where they can meet the full fitness requirements of their role.

2.3.8 Office Ergonomics Assessment

Ergonomics is the science of workplace design that tries to make the job fit the person rather than the person fitting the job. It aims to reduce physical strain and prevent injury by designing or modifying the work area, work methods, or tools.

An employee can suffer an injury when their work station or office desk is set up inappropriately. Injury can result from static loading to muscles or from repetition injury to tendons/muscles/ligaments.

The Ergonomics Self-Assessment Checklist should be used by employees to undertake a self-assessment of their work area. [Self-assessment checklist](#)

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If the checklist identifies any issues an ergonomic assessment can be arranged by contacting the Injury Management Advisor. rh.im.advisor@royhill.com.au.

The assessment should also consider the specific job demands of the employee. Length of time that an employee is office based should be considered when conducting the assessment.

Not all employees require equipment/aids/appliances; rather the individual job demands and physical characteristics must be considered and used to guide the recommendations.

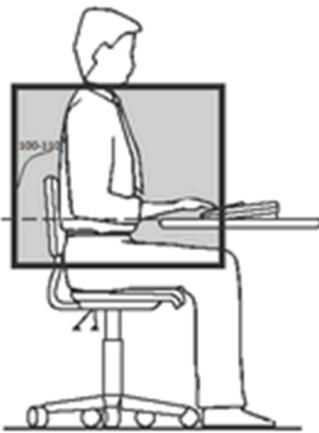
The ergonomic assessment should also consider the following factors:

- office furniture/equipment availability and set up
- sustained postures and workstation layout
- work organisation
- lighting and environmental conditions

2.3.9 Office Furniture / Equipment Availability and Set Up

All work station furniture should comply with *AS 3590.21190 – Screen Based Work Stations part 2: Work Station Furniture*. Correct set up of workstations can prevent injury, improve efficiency and improves employee comfort.

The work stations should be set up using the following guidelines:

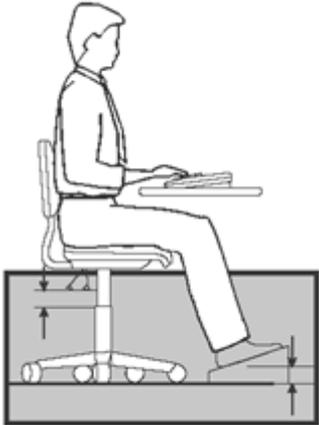
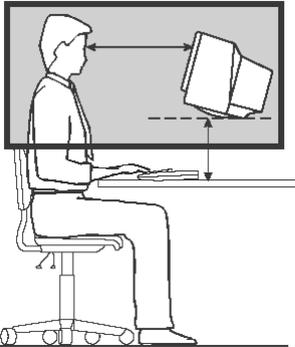
Set - up Guidelines	
<p>Chair</p> 	<p>The chair is the first workstation item which should be adjusted.</p> <p>A chair should have good lumbar support fitted to the small of the back, good overall back support, adjustable back rest, adjustable in height, edge of seat pan should be 1-2 inches from knee crease, should support good posture, move freely under the desk and be generally comfortable.</p> <p>Seat</p> <p><i>Height</i></p> <ul style="list-style-type: none">• Adjust the seat height so the feet are flat on the floor.• The thighs should be horizontal and lower legs approximately vertical in this position. <p><i>Tilt</i></p> <ul style="list-style-type: none">• If the chair can tilt, initially set it to horizontal and then tilt slightly forward to improve comfort. <p><i>Width/Depth</i></p> <ul style="list-style-type: none">• The end of the seat should be 3-4 finger widths from the back of the knee.• The seat should be wide enough to not apply pressure to the lateral thighs. <p>Back Support</p> <p><i>Height</i></p> <ul style="list-style-type: none">• The back-rest support should be set to its maximum height and then slowly lowered until the most comfortable position is found.• Ensure the support is not set too low. <p><i>Angle</i></p> <ul style="list-style-type: none">• A recline of 100-110° of the seat back is preferred to decrease postural muscle activity and disk pressure of the lumbar spine.• A comfortable pressure on the low back should be felt without feeling like being 'pushed' out of the chair.

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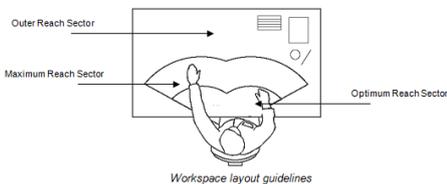
Set - up Guidelines	
	<p>Armrests</p> <p>For most keyboard activities, chairs should not have armrests. Refer to: AS 4438-1997.</p> <ul style="list-style-type: none"> Arms should not rest on armrests while typing as this can compress the flexor muscles and the ulnar nerve at the elbow. Armrests should not be in a position that obstructs the chair from moving into correct position under the desk. Remove or replace with smaller ones if required.
<p>Desk</p> 	<p>The desk should allow free movement of legs underneath it, adequate thigh clearance, adequate space to complete tasks and should be at least 90 cm deep, if using a normal monitor (less depth is needed for flat screen). Refer to: AS 4442</p> <p>Height - Height Adjustable Desk</p> <ul style="list-style-type: none"> Adjust the top surface of the desk to just below elbow height so that elbows are at approximately 90°. <p>Non-Adjustable Desk</p> <p>If the chair has been adjusted and the desk is higher or lower than the elbow then other adjustments will need to be made</p> <p>If the desk is too high:</p> <ul style="list-style-type: none"> Raise the height of the chair. Use a footrest to regain correct leg position. <p>If the desk is too low:</p> <ul style="list-style-type: none"> Raise the desk using objects under the legs OR Place objects under the keyboard / mouse pad to raise.
<p>Computer</p> 	<p>This should be considered after obtaining optimal position of the desk and chair.</p> <p>Keyboard</p> <ul style="list-style-type: none"> Tilt the keyboard (feet at the back) to find neutral wrist position – usually flat on desk. Bring as close to the front of the desk as possible. Place so that the alphanumeric section is in a central position if typing is the predominant activity, with the 'B' key in line with your nose. Do not place documents between the keyboard and the front desk edge while typing. The elbows should sit at 90° (or slightly greater) when typing with the arms close to the body. <p>Mouse</p> <ul style="list-style-type: none"> Place as close to the keyboard as possible, and at the same height. Hold loosely with the wrist in a relaxed and neutral position. Use the whole arm and shoulder to move the mouse without resting the forearm on the desk. Set the 'tracking speed' to one that suits the user. <p>Monitor</p> <p>Height</p> <ul style="list-style-type: none"> Eyes should be in line with just below the top of the screen, putting the angle of your neck looking down to 15-20°. When seated comfortably reaching an arm out horizontally, the middle finger should almost touch the centre of the screen. <p>If screen is too low:</p> <ul style="list-style-type: none"> Raise with phone books or an adjustable platform <p>If screen is too high:</p> <ul style="list-style-type: none"> Remove hard drive from underneath if relevant. Adjust with an adjustable platform

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Set - up Guidelines	
	<p><i>Distance</i></p> <ul style="list-style-type: none"> Ideally arm's length away <p><i>Position</i></p> <ul style="list-style-type: none"> Usually centrally in front the user. If working from documents frequently, place the document holder in a similar position to the screen so the user looks evenly between the two. <p><i>Laptops</i></p> <ul style="list-style-type: none"> The screen and keyboard are rarely at a comfortable height and distance for working.
Posture	<p>Good posture includes the following:</p> <ul style="list-style-type: none"> Shoulders relaxed Elbows level with the home row of keys and close to sides of the body Wrists straight Ample leg room Balanced, upright head position Avoid pressure at the front of the seat Feet firmly supported (flat on floor or on a foot rest) <p>Following the points below may also reduce the risk of injury:</p> <ul style="list-style-type: none"> Avoid sitting for long periods of time without rest breaks. These rest breaks should involve doing "other" work, not just resting. Adopt the 20-20 rule i.e. after 20 minutes looking at the screen, focus on 20 meters away for 20 seconds, moving your eyes up, down and across. Do regular exercises and stretches throughout the day.
<p>Work Area Organization</p>  <p>The diagram illustrates a person's workspace with three reach sectors: 'Outer Reach Sector' (the furthest), 'Maximum Reach Sector' (the range of the arm), and 'Optimum Reach Sector' (the most comfortable range). A computer monitor and keyboard are shown within the optimum reach sector.</p>	<p>The work area should be arranged so that all material, equipment and controls can be easily reached without stretching or twisting. The proper location of equipment will depend on the specific demands of the job. Any materials accessed regularly should be positioned within easy reach without stretching. Storage materials such as filing cabinets should be positioned in a way that encourages the employee to stand up to access the files, rather than over reach.</p> <p>A document holder should be used if hardcopy documents are referred to regularly whilst performing screen based work, and should be positioned between the keyboard and monitor to reduce neck movement.</p>
Lighting and Environmental Conditions	<p>Adequate lighting should be maintained, with task lighting if required. Office lighting should meet the requirements of AS 1680.2.2- Interior & Workplace Lighting – Office and Screen Based Tasks.</p> <p>Thermal comfort should be maintained and glare from lights/windows on the computer screen should be minimised.</p>

2.4 Third Stage: Risk Control

The risk control process should follow the Hierarchy of Controls (HOC) for hazard and risk management. There are three main types of control measures that can be applied to hazardous manual tasks. The Manual Handling Risk Control table, found in the Manual Handling Risk Factors Checklist should assist with appropriate risk control measures.

The preferred order is:

- 1) Eliminate the hazard.
- 2) Redesign, modify, alter or substitute:

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- The work area or layout
 - The nature of items, equipment and tools
 - The work environment and/or
 - The systems of work, work environment and work practices
- 3) Apply administration controls by:
- Providing information, manual handling training and supervision
 - Developing and enforcing policies and procedures

2.4.1 Elimination

The first and most effective strategy in reducing manual handling injuries is to eliminate the task or work practice completely. Where practicable the task should be redesigned or the substance eliminated to remove the hazard.

2.4.2 Redesign, Modify, Alter or Substitute

Where it is not possible to completely remove the hazard, consideration must be made to redesign, modify, alter or substitute the task or work practices. This may involve the following:

- Altering the design and layout of the workplace
- Altering the nature of the load (including using mechanical aids or assistive devices)
- Altering the nature of the items used during manual tasks or
- Altering the working environment (such as using guarding, dust/fume extraction systems)

Where possible Roy Hill shall replace heavy items for lighter objects, smaller objects and/or objects with better improved handling characteristics (such as handles, less awkward size and shape). This may involve planning with suppliers, packaging departments or delivery providers. Upgrade to better quality tools with improved efficiency to reduce force required to perform task.

The following risk factors should be considered when looking through risk control strategies:

Risk Factors	Potential risk control strategies
The Task	Improve task layout Improve accessibility to equipment Improve maintenance of equipment Use the body more efficiently Improve the work routine Use team handling
The Load	Make it lighter and/or easier to push or pull Make it smaller or easier to manage Make it easier to grasp/carry Make it more stable Make it safer to hold

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Risk Factors	Potential risk control strategies
The Work Environment	Reduce space constraints Improve access Prepare floor to best possible condition Optimise work heights Optimise thermal environment Improve lighting in critical areas Reduce unacceptable noise Take account of special clothing and equipment
Work Organisation	Minimise manual handling including rehandling Ensure adequate numbers of workers to do the work safely Ensure sufficient time to do work safely Minimise handling when workers are tired such as at the end of the shift or when overtime is being worked Use equipment which is appropriate to the task
Individual Capability	Provide adequate and appropriate training for individuals undertaking the task Make the best use of skills and experience Take account of varying physical capabilities Take account of the effects of increasing age Take account of individual limitations including recurrent disability

2.4.3 Administrative Controls

Administrative controls are the least effective risk control method; however, they are best used as part of a comprehensive control strategy to compliment design controls or for short-term risk management.

Examples of administrative controls include developing workplace policies and procedures, providing specialist training or placing a supervisor in place to monitor the environment.

Training in manual tasks risk assessment is an important control and should be used in the following scenarios:

- Induction process – online training
- When a new task is introduced or
- As a refresher

Supervisors should ensure that they discuss the potential hazards of manual handling during pre-work discussions (e.g. toolbox or pre-shift meetings), Job Hazard Analyses and risk assessments. Control strategies to eliminate and or reduce the potential should be discussed and implemented prior to work commencing.

2.5 Follow Up and Review

Follow up and review is an important stage in the risk control plan. This involves investigating that the hazards and risks that have been identified have been reduced and the control strategies put in place are being effective. It also ensures that no new risks have been introduced.

There are three stages of follow up, which involve the following:

- 1) Consultation with employees, supervisors, and safety and health professionals in manual tasks:
 - Has the controlled risk reduced the physical strain or difficulty?
 - Have new risks been identified since the controls were implemented?

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- Since the controls have been put in place, have existing problems worsened?
- 2) Observation of tasks:
 - Observe the improved task to determine whether the initial risk factors have been minimised.
 - Ensure that the controls implemented have been successful and new hazards have been introduced.
 - Review and update the JRP.
- 3) Monitoring of Injury Reports and Statistics:
 - Monitor injury data for any new trends.

2.6 Data Management and Reporting

Record any hazardous manual tasks identified, assessment of the risks associated with them, control measures that were selected and implemented, and the evaluation of the implemented control measures.

Risk assessments need to be formalised into a document to demonstrate what hazards have been considered and that the risks are 'as low as reasonably possible'. Any changes to the work scope as defined by the findings in the risk assessment need to be documented in writing and presented to the work group in the form of a pre-start meeting or a tool box meeting so that all relevant people are aware of changes and any residual risk associated with the job. It is good practice to have copies of these risk assessments attached to WINs at the work site to reflect the changes to the work scope as defined in the risk assessment.

Similarly, incidents and accidents should also be reported to prevent recurrence of incidents with similar causes. This is done by:

- Determining the precise cause of the incident
- Recommending changes to prevent similar incidents
- Communicating the findings to others where the potential for a similar incident exists

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3 Accountabilities

Position Title	Role	Description of Task
Department Managers	Ensure Compliance	Ensure manual handling and ergonomic hazards are continually identified, assessed, controlled and monitored. Ensure all employees have appropriate training in manual handling, sprain/ strain injury management, office ergonomics and basic ergonomic principles. Ensure that all new equipment and processes consider and control ergonomic hazards and risks prior to their implementation.
All employees & Contractors Personnel	Participate	Participate in hazard identification, risk assessment and the development of control strategies.
HSE Department	Support	Provide support in hazard and risk assessment and the development of risk management strategies.

4 Definitions

Term	Definition
Activity	Refers to the movement by or postures of an employee at any given time to perform a task
Ergonomics	The science of fitting the job to the worker. It describes the relationship between people the equipment they use, the work processes and the general environment. Ergonomics (or human factors) is the scientific discipline concerned with the understanding of the interactions among humans and other elements of system and the application of theory principles, data and methods to design to optimize human wellbeing and overall system performance.
JRP	Job Role Profile. A document that identifies the manual handling and ergonomic risk of the role.
Manual handling	Means any activity requiring the use of force exerted by a person to lift, lower, push, carry or otherwise move, restrain or hold any inanimate object. Including any activity involving the repetitive and/or forceful movements and any activity where the person must maintain constrained or awkward postures.
Hazard	Anything that may result in injury or harm to the health of a person.
Hierarchy of Controls	Also known as the “best order of hazard control” is a listing of control measures ranked in order of effectiveness.
Risk	In relation to any injury or harm, means the probability of that injury or harm occurring.

5 References

Reference	Title
Safe Work Australia	Code of Practice Hazardous Manual Tasks
AS 3590	Screen Based Work Stations
AS 1680	Interior Lighting
AS 4442	Office Desks
Legislation	Occupational Health and Safety Act (1984)

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