



UNIVERSITY
OF WOLLONGONG
AUSTRALIA

UOW SAFE@WORK

MATERIALS HANDLING GUIDELINES

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1 Introduction

The University of Wollongong (UOW) is committed to the prevention of injuries in the workplace to provide a safe environment for staff, students and visitors.

The handling of materials either physically or mechanically often introduces risks to health and safety which can be managed to avoid injury. Inappropriate transport, handling or storage of materials can increase the risk of injuries and illnesses. Inadequate systems may result in overloading of storage facilities, excessive reaching or lifting, restricted aisles and passageways or traffic congestion. The hazards associated with mobile plant are well documented.

This guideline outlines how UOW will comply with its legal requirement under the Workplace Health and Safety Act and Regulation 2011 to identify, assess and control hazardous manual tasks. And the minimum standards and procedures for the safe implementation of materials handling at the University.

2 Definitions

Hazardous manual tasks A hazardous manual task, as defined in the WHS Regulations, means a task that requires a person to lift, lower, push, pull, carry or otherwise move, hold or restrain any person, animal or thing involving one or more of the following:

- * repetitive or sustained force
- * high or sudden force
- * repetitive movement
- * sustained or awkward posture
- * exposure to vibration.

These factors (known as characteristics of a hazardous manual task) directly stress the body and can lead to injury.

Musculoskeletal disorders (MSDs) A musculoskeletal disorder, as defined in the WHS Regulations, means an injury to, or a disease of, the musculoskeletal system, whether occurring suddenly or over time. It does not include an injury caused by crushing, entrapment (such as fractures and dislocations) or cutting resulting from the mechanical operation of plant. MSDs may include conditions such as:

- * sprains and strains of muscles, ligaments and tendons
- * back injuries, including damage to the muscles, tendons, ligaments, spinal discs, nerves, joints and bones
- * joint and bone injuries or degeneration, including injuries to the shoulder, elbow, wrist, hip, knee, ankle, hands and feet
- * nerve injuries or compression (e.g. carpal tunnel syndrome)
- * muscular and vascular disorders as a result of hand-arm vibration

- * soft tissue hernias
- * chronic pain.
- * MSDs occur in two ways:
 - * gradual wear and tear to joints, ligaments, muscles and intervertebral discs caused by repeated or continuous use of the same body parts, including static body positions
 - * sudden damage caused by strenuous activity, or unexpected movements such as when loads being handled move or change position suddenly.

Forklift truck Means a powered industrial truck equipped with a mast and elevating load carriage to which is attached a pair of fork arms or other load-holding attachment but does not include any pedestrian –operated fork lift truck or a pallet truck capable of providing a maximum lift not exceeding 225mm.

3 Responsibilities

3.1 Managers/Supervisors

Managers/Supervisors are responsible for implementing these guidelines and consulting with employees in the process of hazard identification, assessment and control specifically in relation to materials handling activities. Managers and supervisors are to ensure that work practices involving materials handling are designed to be safe and without risk to health and safety.

3.2 Workers and Students

Workers and students are responsible for co-operating in risk management processes, as well as working in a manner consistent with safe materials handling and following developed work procedures.

3.3 WHS Unit

The WHS Unit is available for consultation on materials handling issues; and the development, monitoring and evaluation of specific manual handling training for staff.

4 Managing Hazardous Manual Tasks

4.1 Identification

The first step in managing risks from carrying out hazardous manual tasks is to identify those tasks that have the potential to cause Musculo-Skeletal Disorders (MSD). Hazardous manual tasks are those tasks that require a person to lift, lower, push, pull, carry or otherwise hold or restrain any person, animal or thing that involves one or more of the following:

- * repetitive or sustained force
- * high or sudden force
- * repetitive movement
- * sustained or awkward posture
- * exposure to vibration.

Hazards that arise from manual tasks generally involve interaction between a worker and:

- * the work tasks and how they are performed
- * the tools, equipment and objects handled
- * the physical work environment

Hazardous manual tasks can be identified by:

- * reviewing the duties in position descriptions to identify manual handling risks
- * talking to staff/students who are involved in manual handling tasks to find out what hazards are involved
- * analysing WHS and Workers Compensation statistics to find out the number of manual handling and injuries, the cause of these injuries and where they are coming from
- * observing how workplace equipment is set up, and the associated workflows between different areas
- * observing staff performing manual handling tasks, particularly tasks that require awkward postures, movements and repetitive movements
- * workplace inspections to observe how tools, materials and equipment are stored
- * Investigating manual handling incidents to what caused the injury

NOTE: You must identify hazards before using your workplace or equipment for the first time, before or during changes to plant and work practices, while work is being conducted, and when relevant information becomes available.

4.2 Assess the Risks

A risk assessment allows you to examine the characteristics of a manual task in more detail. You should carry out a risk assessment for any manual tasks that you have identified as being hazardous, unless the risk is well-known and you know how to control it. A risk assessment can help you determine:

- * which postures, movements and forces of the task pose a risk
- * where during the task they pose a risk
- * why they are occurring

- * what needs to be fixed

When conducting a risk assessment of manual tasks the following factors must be taken into consideration.

- * the posture of the worker
- * the forces exerted by the worker and any forces exerted on the worker by the object, person or animal
- * speed of movements by the worker
- * exposure of the worker to vibration; and
- * the duration and frequency of the task

You must also take into consideration the possible sources of the risks including

- * the layout or design of the work area. For example is the area set up to prevent awkward postures.
- * the work environment. Sources of risk in a work environment include temperature, humidity, floor surfaces, lighting and obstructions.
- * consider the nature, size, weight or number of persons, animals or things handled including any tools used ; and
- * work organisation and the system of work. For example the pace of the work and time constraints.

These sources of risk can also make the task more difficult to perform and therefore increase the risk of MSD. The Manual Handling Risk Assessment Form can be used to assist in identifying and controlling manual handling risks.

4.3 Controlling the risk

You must aim to eliminate any hazardous manual tasks and any associated risks. If it is not reasonably practicable to eliminate the risk then the risk must be minimised using one or more of the options from the hierarchy of controls.

Control measures should be aimed at eliminating or minimising the frequency, magnitude and duration of movements, forces and postures by changing the source of risk: the work area, tool, load, environment, method of handling and/or the way work is organised.

HIERARCHY OF CONTROL		EXAMPLES OF CONTROL MEASURES
Level 1	Elimination	<ul style="list-style-type: none"> * Automate the manual task (such as using remote controls) * Deliver goods directly to the point of use to eliminate multiple handling
Level 2	Substitution	<ul style="list-style-type: none"> * Replace heavy items with those that are lighter, smaller and/or easier to handle * Replace hand tools with power tools to reduce the level of force required to do the task
	Isolation	<ul style="list-style-type: none"> * Isolate vibrating machinery from the user, for example by providing fully independent seating on mobile plant
	Engineering	<ul style="list-style-type: none"> * Use mechanical lifting aids * Provide workstations that are height adjustable

Level 3 Administrative	<ul style="list-style-type: none"> * Rotate workers between different tasks * Train workers to use control measures implemented when carrying out normal tasks 	
	Personal protective equipment	<ul style="list-style-type: none"> * Heat resistant gloves for handling hot items * Shock absorbent shoes for work on hard concrete floors

4.3.1 Training

Training in the type of control measures implemented should be provided during induction into a new job and as part of an on-going manual task risk control program. Training should be provided to:

- * workers required to carry out, supervise or manage hazardous manual tasks
- * in-house designers, engineers and officers responsible for the selection and maintenance of plant and/or the design and organisation of the job/task
- * any health and safety representatives.

The training should include information on:

- * manual task risk management, including the characteristics of hazardous manual tasks
- * specific manual task risks and the measures in place to control them
- * how to perform manual tasks safely, including the use of mechanical aids, tools, equipment and safe work procedures
- * how to report a problem or maintenance issues.

4.4 Review controls

Control measures that have been implemented must be reviewed and, if necessary, revised to make sure they work as planned and to maintain a work environment that is without risks to health and safety. Control measures may be reviewed using the same methods as the initial hazard identification step.

Consult with the workers involved in the manual task and their health and safety representatives and consider the following:

- * are the control measures working effectively in both their design and operation, without creating new risks?
- * are workers actively involved in the risk management process? Are they openly raising health and safety concerns and reporting problems promptly?
- * have new work methods or new equipment reduced physical strain or difficulty?

- * has instruction and training on hazardous manual tasks and the implemented control measures been successful?
- * is the frequency and severity of MSDs reducing over time?
- * is an alteration planned to any structure, plant or process that is likely to result in a worker being exposed to a hazardous manual task?
- * has an incident occurred as a result of a worker being exposed to a hazardous manual task?
- * if new information becomes available, does it indicate current controls may no longer be the most effective?

If problems are found, go back through the risk management steps, review your information and make further decisions about risk control.

5 Mechanical Handling

The use of mechanical equipment to move and store materials can increase the risk of injury to employees. Before operating mechanical equipment to handle materials, a risk assessment should be completed in accordance with the WHS Risk Management Guidelines. In particular, thought should be given to:

- * the most appropriate mechanical equipment to assist with materials handling
- * the load rated capacity (maximum weight) of the selected mechanical equipment to avoid overloading
- * traffic management and the need to ensure provisions are made to guarantee pedestrian safety for a traffic management plan.

If the mechanical handling is assessed as medium or high level of risk, risk controls including isolation or development of safe work procedures may be required to be developed for the task consisting of an action plan to manage traffic and ensure pedestrian safety. If traffic management is required this should be completed by a qualified person in accordance with the [WHS Training Guidelines](#).

6 Forklifts

6.1 Purchasing and Acquisition

When purchasing or acquiring a forklift the following is required:

- * all forklifts must comply with manufacture and operation standards AS 2359.1, AS 2359.2 and AS2359.3
- * in particular, forklift trucks must be fitted with a driver's overhead guard that is designed and constructed to provide reasonable protection for the driver from falling objects
- * ensure adequate mirrors are properly adjustable to provide all-round visibility
- * consideration should be given to the type of seating in relation to the operator and ergonomic comfort, such as:
 - seat height and depth
 - fabric covering
 - backrest height and angle

- partial pivoting (if operators will spend long periods looking behind them)
- fore and aft movement
- seat tilt
- firm padding
- vibration absorbing suspension.

A risk assessment must be completed prior to the purchase and acceptance of a forklift to ensure adequate controls are in place dependent upon the use of the forklift. A safe work procedure shall be developed for the operation of the forklift for use in the area.

6.2 Certificate of Competency

All persons who use a forklift at the University must have the appropriate certificate of competency in order to use these vehicles. The certificate of competency is assessed and issued by a registered training organisation. Prior to use of any forklift at the University, the certificate of competency must be provided to the WHS Unit for addition to the certificate of competency database. Evidence of renewal must be provided where appropriate.

Any incident, near miss or unsafe operation associated with the use of forklift will necessitate refresher training in forklift operation. Inappropriate behaviour with regards to the use of forklift may necessitate the suspension of approval to use a University forklift.

6.3 Operation

Forklift drivers are required to comply with the practices and requirements as outlined in the WorkCover NSW Forklift Drivers Guide. In particular:

- * permission must be obtained from the appropriate Manager or Supervisor before using any forklift
- * the operator must undertake pre-operational checks as described above
- * the operator must adjust the seat so that all controls can be operated comfortably and safely
- * adjust all mirrors for maximum visibility, and ensure there are no people in the vicinity of the vehicle
- * operate self-starter (where fitted) only from the driving position
- * vehicles shall:
 - be driven safely, carefully and sensibly at all times
 - be properly and securely parked before the driver dismounts. Never mount/dismount whilst vehicle is moving
- * vehicles shall not:
 - be driven at excessive speed or above posted speed limits
 - carry passengers unless fitted with approved dual seating, which complies with the regulations
 - be driven on roadways with brake pedals uncoupled
 - be left whilst unattended and in gear with the engine running
 - be left with hydraulic implement raised or hydraulic system under load
 - be refuelled with the engine running
 - carry, lift, push or pull beyond manufacturer's specified limits

- * operators of forklifts are not to be under the influence of alcohol or drugs.

6.4 Inspection and Maintenance

University forklifts are required to be inspected by the operator using [Forklift Truck Checklist](#) on a 6 monthly basis. University forklifts are required to be maintained by a competent person according to AS2359.2, Section 6 as per the manufacturer's recommendation. Records of forklift maintenance shall be appropriately retained. Further information outlining the specific requirements are outlined in the standard and summarised in the [Managing the Risk of Plant Guidelines](#).

Further, pre-operational checks of forklifts are required by the operator including:

- * vehicles are to be visually checked for battery corrosion and any obvious loose parts or materials reversing alarms are to be functional and mirrors adjusted
- * all breakages and non-functioning parts are to be reported as soon as possible
- * steps and working platforms are free of any material that could cause potentially serious slips and falls
- * all guards are in place and any power take-off drives are properly guarded with fixed guard
- * seatbelts are in good working order if fitted
- * warning lights and beepers are operational if fitted.

7 Other Mechanical Lifting Aids

7.1 Hand Truck (2-Wheel Trolley)

The following principles should be applied for the safe use of hand trucks:

- * load weight should be within the Rated Load (RL) of the particular trolley
- * load should be stable and have a centre of gravity not higher than handle height
- * keep the centre of gravity low by placing heavier items below the lighter ones
- * load height should be such that the operator has clear visibility in the direction of travel
- * place the load so that it will not slip, shift or fall, and secure it with straps if they are provided
- * always wear enclosed footwear when using this equipment to move items
- * distance to be travelled should not be greater than 35m without a break
- * path should be free of obstacles and be at least 1m wide
- * load weight of one-person handling should not exceed 100kg
- * push the load so that the weight will be carried by the axle and not the handle
- * tip the load slightly forward so that the tongue of the hand truck goes under the load and then push the tongue of the hand truck all the way under the load
- * do not walk backward with a hand truck unless going up stairs or ramps
- * when going down an incline, keep the hand truck in front of you so it can be controlled at all time
- * move hand trucks at a walking pace
- * hand truck should not be used by an employee more than 200 times per day

- * store hand trucks with the tongue under a pallet, shelf or table.

7.2 Hand Trolley (3-, 4-, 5-, 6- Wheel Trolley)

The following principles should be applied for the safe use of hand trolleys:

- * load weight should be within the RL of the particular trolley
- * use a trolley that is designed in accordance with ergonomic guidelines
- * for 3-wheel trolleys, the load should be stable and have a centre of gravity not higher than handle height
- * place the load so that it will not slip, shift or fall, and secure it with straps if they are provided
- * always wear enclosed footwear when using this equipment to move items
- * load height should be such that the operator has clear visibility in the direction of travel—if the view is obstructed, get a second person to assist
- * load length should be such that the trolley and load are easily manoeuvrable, and can be readily stopped
- * consider the use of two persons to handle trolley loads longer than 4m to minimise the risk of injury from the high force required to stop the load suddenly and maintain its stability should it come into contact with other persons, or fixtures or items
- * total distance travelled with a load should not exceed 400m
- * path should be free of obstacles and have good clearance for the trolley
- * do not walk backward with a hand trolley unless going up ramps
- * when going down an incline, keep the trolley in front of you so it can be controlled at all times
- * use a trolley fitted with brakes if required to stop on a ramp or regularly use a ramp;
- * move hand trolleys at a walking pace
- * hand trolleys should not be used by an employee more than 200 times per day
- * if trolleys are pushed up a slope, the load should be reduced so that the recommended rolling force limit is not exceeded.

7.3 Hand Pallet Jack

The following principles should be applied for the safe use of hand pallet (electrical and manual) jacks:

- * load weight should be within the RL of the particular hand pallet jack
- * load height should be such that the operator has clear visibility in the direction of travel. If the view is obstructed, get a second person to assist
- * secure the load on a pallet or place it in a stillage so that it will not slip, shift or fall
- * distance to be travelled should not be greater than 35m
- * path should be free of obstacles and be at least 1.3m wide
- * if a T-handle is used, it should be long enough to protect the employee's feet from being struck by the pallet during pulling activities
- * if hand pallet jacks are pushed up a slope, the load should be reduced so that the recommended rolling force limit is not exceeded
- * do not walk backward with a hand pallet jack unless going up ramps

- * when going down an incline, keep the pallet jack in front of you so it can be controlled at all times
- * use a hand pallet jack fitted with brakes if required to stop on a ramp or regularly use a ramp
- * move hand pallet jacks at a walking pace
- * start and stop the pallet jack gradually to prevent the load from slipping
- * hand pallet jack should not be used by an employee more than 200 times per day
- * due to the wheel design, do not use hand pallet jack on gravel, damaged, or uneven surfaces
- * always wear enclosed footwear when using this equipment to move these items
- * never ride on hand pallet jacks.

7.4 Pedestrian Traffic Safety

Use of mechanical aids to move materials should not place pedestrians at risk. Where appropriate:

- * clear walkways for pedestrians should be marked and identified to isolate pedestrian areas from traffic areas and minimise pedestrian/vehicle interaction
- * loading and unloading docks/areas should be clearly marked and identified
- * designated storage areas should be marked and identified.

8 Materials Storage

8.1 Storage Racking

As outlined in Australian Standard 4084: Steel Storage Racking, the following is required to be implemented for the safe use of pallet racking or steel storage racking:

- * the safe working unit load or the safe working total load per bay for the racking installation shall not be exceeded
- * the racking installation shall not be altered to deviate from the load application and configuration furnished for the racking installation
- * physical alterations to uprights, bracings, beams or components, such as welding on additional cleats or bearers, shall not be made. In addition, change of use, such as from timber pallets to post pallets, shall not be permitted
- * any hazardous situations which may exist in relation to the operation or maintenance of the racking installation shall be reported
- * any damage incurred, however minor, shall be reported so that its effect on safety can be immediately assessed.

Inspections shall be carried out on a regular basis, and at least once every twelve months to –

- * ensure the correct application and use of equipment
- * ensure that the safe working loads are adhered to
- * ensure that the racking installation has not been altered. A copy of the load application and configuration drawings shall be retained for this purpose
- * examine the extent of damage due to impact in the racking installation
- * examine the out-of-plumb of the racking

- * examine for any dislocation and deformation of sections and connections for uprights and beams, and
- * examine connectors for deformation or signs of cracking of the welds.

Acceptable tolerances for damage to racking is as follows:

- * bracing – for bracing, the member deviation from a 1 m long straight edge in either plane shall not exceed 10 mm
- * beams – for beams, the permanent vertical deformation when unloaded shall not exceed L/800 and the permanent horizontal deformation shall not exceed L/500
- * connectors – connectors shall not show visible permanent deformation or signs of cracking of welds
- * out-of-plumb of racking – the out-of-plumb of unloaded racking caused by impact shall not exceed the finished tolerances given in Table 4, factored by 1.5 of AS4084.

8.2 General Storage and Housekeeping

General risk control measures for safe storage and good housekeeping include:

- * ensuring walkways and other thoroughfares are clear of clutter
- * regular cleaning and disposal of rubbish from these areas
- * maintaining good housekeeping in reception areas and high traffic areas
- * arranging materials in an orderly manner according to a designated storage system of the office. If an area has no designated storage system that a logical method of storage may be devised by the supervisor in consultation with staff
- * provide sufficient access (at least 1m) to all work stations and areas, exits, fire extinguishers, fire blankets, electrical disconnects, safety showers, and other emergency aids
- * keep free of physical obstructions that would prevent access, including objects, blocking path, spills of liquids or solids, etc
- * keep all door entrances completely free of debris, shrubs, or other obstructions
- * floors should be clean, dry, and free of waste, unnecessary material, oil and grease
- * have an adequate number of waste receptacles provided at accessible locations throughout all work areas.

8.3 Local Procedures

Where appropriate local area procedures will outline the requirements for safe stacking heights, storage areas, speed limits, traffic management etc.

9 Related Documents

- * [Manual Handling Risk Assessment](#)
- * [WHS Risk Management Guidelines](#)
- * [Incident Management and Reporting Guidelines](#)
- * [Alcohol and Drugs in the Workplace Policy](#)
- * [Development of Safe Work Procedures Guidelines](#)
- * [Managing the Risk of Plant Guidelines](#)

* [WHS Records Handling Guidelines](#)

10 Reference Documents

- * [Work Health and Safety Act 2011](#)
- * [Work Health and Safety Regulation 2011](#)
- * [Hazardous Manual Tasks Code of Practice, SafeWork NSW](#)
- * [A Guide To Handling Large, Bulky Or Awkward Items, WorkSafe Victoria.](#)

11 Program Evaluation

In order to ensure that these guidelines continue to be effective and applicable to the University, the program will be reviewed triennially by the WHS Unit and relevant stakeholders. Conditions which might warrant a review of the guidelines on a more frequent basis would include:

- * a significant injury or near miss resulting from materials handling;
- * changes to legislation
- * employee concern.

Following completion of any review, the program will be revised and updated in order to correct any deficiencies.

12 Version Control Table

Version Control	Date Released	Approved By	Amendment
1	August 1998	Manager WHS	Document created
2	November 2003	Manager WHS	Document updated to reflect current requirements
3	November 2006	Manager WHS	Document design modified to new template
4	September 2009	Manager WHS	Review of document to include materials handling e.g. mechanical lifting aids and storage as well as manual handling.
5	April 2010	Manager WHS	Minor review, no significant changes.
6	August 2010	Manager WHS	Document updated to incorporate the Personnel name change to Human Resources Division.
7	April 2011	Manager WHS	Included requirement to conduct a manual handling risk assessment for any high or extreme rated manual handling activity.
8	March 2012	Manager WHS	Re-brand
9	March 2013	Manager WHS	Legislative update
10	April 2015	Manager WHS	Aligned to the risk management methodology outlined in the Business Assurance Risk Management Policy. Removed references to extreme risks.
11	July 2016	Manager WHS	Scheduled review. Rebrand. Added process for managing hazardous manual tasks.

12	September 2016	Manager WHS	Removed requirement for safe work procedures in section 8.1 as this guideline outlines the procedures for safe use of storage racking.
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