The background of the cover is a close-up photograph of a construction worker wearing a grey work jacket and holding a bright yellow hard hat. The worker's face is partially visible, looking down. The image is overlaid with several semi-transparent yellow geometric shapes, including triangles and polygons, which create a modern, layered effect.

An Introduction to the Management of Manual Handling in the **Construction** Sector

A Five-Step Approach



Our vision:

A country where worker safety, health and welfare and the safe management of chemicals are central to successful enterprise



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INTRODUCTION

This guide has been put together as an introduction to the management of manual handling in the construction sector. The main objectives of the guide are:

- To present the business case for managing the hazard of manual handling in construction
- To outline briefly the legislation that relates to manual handling
- To explain the potential health effects of not managing the hazard of manual handling
- To explain the five steps of manual handling risk assessment

In 2008 the Health and Safety Authority commissioned research to investigate manual handling in the construction industry. The research work was completed by the Health and Safety Laboratory (HSL), which presented a report on their findings in late 2009. The report concluded that the manual handling tasks observed were considered to expose individuals to a medium to very high level risk of musculoskeletal injury and ill health. This guide has been prepared as a first step towards the introduction of specific interventions for managing manual handling risks on-site, in particular the potential risks posed by those tasks identified in the HSL report. The full report can be viewed at the HSA website, www.hsa.ie

As pointed out by HSL, the findings of the report should serve as a focused starting point or baseline for stakeholders in the construction industry to work together to develop best practice guidance and to investigate risk reduction measures.

There are approximately 109,000 people working in this industry. It is a sector where the nature of work conducted varies greatly. However, it is also a sector where workers engage in work tasks which require a significant amount of manual handling.

There are many examples of manual handling activities that take place in construction, including the handling of blocks, glazing, plaster board and other similar tasks.

In the example opposite two workers are lifting a glazing unit over a distance in order to prepare the unit for final assembly on-site. Manual handling is a physical activity that takes place in every workplace. In some cases it does not pose a problem. However, it is important to be aware that manual handling can be a potential workplace hazard and that particular difficulties arise when the work activity exposes construction workers to risk factors including handling very heavy loads, awkward twisting, bent postures or working in an environment with poor access.



The Business Case

The lack of management of the hazard of manual handling remains prevalent within the construction industry and continues to be a causal factor in a considerable number of injuries sustained by employees. In the period 2006–2011 up to 1600 injuries due to a lack of the management of manual handling in construction were reported to the Health and Safety Authority, accounting for at least 21,000 lost days. According to the publication 'Patterns of Ill Health Amongst Irish Construction Workers 1997-2004', 133,268 days were lost in that period due to musculoskeletal disorders (MSDs).

While it is difficult to determine an exact cost for musculoskeletal injuries in construction, it can be said that there are multiple direct and indirect costs associated with an injury. The direct costs to employers arise from sick pay, liability insurance, administration, recruitment and, in some cases, damages. The indirect costs which are not covered by insurance policies include replacing injured employees, downtime, lost productivity, loss of contracts and legal costs.

In 2005 the Construction Health Trust published a comprehensive survey into the causes of ill health among Irish construction workers. Musculoskeletal disorders were identified as the second most common cause of absenteeism, accounting for 22.8% of days lost. Each year our Benevolent Fund receives numerous applications for assistance from workers who have been medically certified unfit for further construction work, and have been granted early retirement or disability allowance. Unfortunately the majority of applicants fall into the 45–58 age range.

– Brian Daly, CEO, Construction Workers' Health Trust

The business case for adopting a risk management approach in tackling MSDs in the workplace is further supported by a study of civil judgements specifically related to injuries due to manual handling, where the judges identified the following key systems failures when making rulings on compensation claims:

- No risk assessment of work activities
- Lack of safe system of work procedures (SSWPs)
- Mechanical aids not provided and maintained
- Adequate training not provided
- No evidence of work supervision (HSR December 2000)

The consequences of ineffective management can be demonstrated through the case study below.

CASE STUDY

Describing a system of work as unsafe, a high court judge awarded €60,000 to a building worker who suffered injuries. The worker was laying water mains; he had to push 20-foot long and six-foot wide pipes through an opening in order to connect to another pipe.

An engineer considered the work practice as unsafe ; he said “some kind of lever should have been used”

(HSR September 2004)



The next section of the guide introduces the legislation that covers the management of the hazard of manual handling in the workplace.

1. WHAT LEGISLATION COVERS MANUAL HANDLING?

The Safety, Health and Welfare at Work (General Application) Regulations 2007 (SI No. 299 of 2007), Chapter 4 of Part 2, outline the requirements that must be adhered to in relation to manual handling.

Manual handling can be a potential workplace hazard and particular difficulties arise when the work activity exposes construction workers to risk factors such as having to carry heavy loads over long distances. The task opposite shows an example of manual handling on a construction site where a worker is attempting to carry a large unit of plasterboard through a doorway.



It is this type of manual handling which has the potential to have long-term health effects for an employee, and which is provided for under the Regulation.




Manual handling is defined in Regulation 68 of the Safety, Health and Welfare at Work (General Application) Regulations 2007:

Manual Handling involves any transporting or supporting of a load by one or more employees, and includes lifting, putting down, pushing, pulling, carrying or moving a load, which by reason of its characteristics or unfavourable ergonomic conditions, involves risk, particularly of back injury, to employees.

In the example above the characteristic of the load that involves risk would be the weight and size of the plasterboard unit. An example of an unfavourable ergonomic condition would be the physical strain involved for the workers having to lift or carry the plasterboard unit over a long distance. The unfavourable ergonomic conditions are the **risk factors** in the handling activity which have the potential to result in a musculoskeletal injury such as a back injury.

Examples include:

Risk Factor	Example
Load positioned in a manner requiring it to be held or manipulated at a distance from the trunk	

Risk Factor	Example
The physical effort is too strenuous as it can only be achieved by a twisting movement of the trunk	 A line drawing showing a construction worker in a hard hat and safety vest. The worker is bent over, twisting their torso to the right to lift a large, rectangular object from the ground. A bucket is visible on the ground nearby.
Excessive carrying distance	 A line drawing showing a construction worker in a hard hat and safety vest carrying a large, rectangular load on their back. The worker is walking away from the viewer, and the load is significantly larger than the worker's torso.
Repetitive bending of the trunk	 A line drawing showing a construction worker in a hard hat and safety vest bending their trunk forward to work on the ground. The worker is using a tool to work on a surface, and their back is curved at a sharp angle.

The Regulations set out a framework to help employers avoid or reduce the risk of injuries as a result of manual handling activities by avoiding or reducing exposure to unfavourable ergonomic conditions. The basic principle is that where manual handling of loads involves a risk of injury (particularly to the back) the employer must take measures to avoid or reduce the need for such manual handling.

There are three key requirements in the Regulation:

- Avoidance of manual handling

In this example a telescopic handler is used to lift loads.



- Reduction of manual handling

In the example opposite a construction worker uses a hand-held device as a means of reducing manual handling when placing a manhole cover.



- Risk assessment of manual handling tasks

It is necessary to conduct a manual handling risk assessment of the work activity in order to identify potential unfavourable ergonomic conditions and to implement improvements to avoid or reduce the risk of injury. The next section of this guide will describe the potential health effects that can result when the hazard of manual handling is not managed on-site.



2. THE POTENTIAL HEALTH EFFECTS OF NOT MANAGING THE HAZARD OF MANUAL HANDLING

In the previous section of the guide a key focus was understanding that manual handling work activities on a construction site where unfavourable ergonomic conditions are present – including, for example, repetitive bending and twisting of the back or lifting loads away from the body, will result in an increased risk of back injury or other musculoskeletal injuries.

Musculoskeletal injuries affect the musculoskeletal system and can present in the tendons, muscles, joints, limbs or the back. The symptoms may include pain, discomfort, numbness and tingling in the affected area and can differ in severity from mild and periodic to severe, chronic and debilitating conditions.

Apart from the legal requirement to manage the hazard of manual handling in construction, there are ethical reasons to ensure that every effort is made to avoid or reduce the risk of musculoskeletal injury to those that work in the industry and who, as part of their day-to-day work activities, may be required to engage in work practices which involve manual handling.

Testimonial: Tony, construction worker, Dublin

Tony was a construction worker for many years. He is now in his early fifties and has had a number of operations on his back. The work that he carried out on construction sites was a contributory factor to his back problems as the manual handling training received did not relate to his work activities. He cannot return to the work that he enjoyed and was qualified to do, and the back injury has had an effect on his personal life due to his lack of mobility. Manual handling in work activities needs to be treated seriously because there can be serious consequences if it is not managed effectively.

This testimonial underlines the human cost of a musculoskeletal injury and highlights why it is important to manage the hazard of manual handling in the workplace.

Below are further examples of the potential health effects to the back that may result if the hazard of manual handling is not taken seriously and addressed:

- Gradual wear and tear (degeneration of the spine) caused by frequent or prolonged periods of manual handling activity
- Injury to the lumbar spine due to repetitive back bending, pulling and lifting from overhead or forward bending and twisting
- Increased wear and tear or sudden damage to the discs caused by intense or strenuous manual handling or awkward lifts

Conditions such as these may lead to long-term disability and long-term absence from work which is not a desired outcome for employers or employees. It makes good sense for employers to manage the hazard of manual handling on construction sites.

In order to effectively manage the hazard of manual handling, work activities must be assessed to identify the unfavourable ergonomic conditions/risk factors, and an informed decision needs to be taken through proper consultation to decide on appropriate control measures or improvements which should be put in place in order to avoid or reduce the risk of a musculoskeletal injury.

The use of mechanical aids, the reorganisation of a work activity to allow loads to be handled at a safe height and the provision of instruction to construction workers on how to handle loads safely are examples of interventions that need to be considered to address unfavourable ergonomic conditions.

A five-step manual handling risk assessment process is explained in the next section of this guide. This five step process is a useful mechanism to ensure that the hazard of manual handling is effectively managed for work activities on a construction site.



3. THE FIVE STEPS OF MANUAL HANDLING RISK ASSESSMENT

As a first step, it is important to put together a list of work activities that involve significant manual handling on-site e.g. laying pipes or fitting ceilings. Consult with the people who do the job – they are best placed to explain how each task is carried out. As part of this process agreement should be reached on identifying those tasks which are deemed potentially unsafe and which need to be assessed.

The five-step approach

1. Understand how the manual handling task is carried out
2. Collect all the technical details
3. Identify the problems or risk factors that need to be improved
4. Agree and implement the positive changes to minimise the health effects to workers
5. Review

The five steps in a manual handling risk assessment process are explained in the case study below. The work activity involves replacing a ceiling on the fourth floor of an existing office space. There is a goods lift available at ground level. (See also Appendix 1 for an example of a manual handling risk assessment worksheet.)

Step 1: Understand how the manual handling task is carried out

This involves collecting information on how the work activity is performed and identifying the key stages in the task. It should be a team effort involving consultation with people who normally do the job. Typically this would be the person carrying out the work activity on-site, a foreman or health and safety officer. The person carrying out the assessment should have a thorough practical understanding of the type of manual handling tasks being carried out.

Case Study

There are a number of stages in the task of replacing the ceiling:

- The truck arrives with sixty boxes of ceiling tiles. Each box weighs 20 kg
- The boxes are not stored on pallets
- The ceiling tile boxes are lifted manually off the truck, carried to the goods lift and then brought on the lift to the fourth floor
- The ceiling boxes are then lifted from the goods lift to the work area on the fourth floor



Step 2: Collect all the technical details

It is important to collect good quality information about the task. Technical information may include the load's weight and size, the physical measurements of the work area, the number of manual lifts required to complete the task and general information on the work environment such as access routes.

It is good practice to take photographs of the work task and the work environment, as this makes it easier to visualise potential hazards. All this data can be collected while observing the task. At that point, it is advisable to consult with others in order to write up the relevant information and discuss alternative ways of completing the task with less risk.

Examples of technical details collected in relation to the work activity of ceiling replacement:

- The weight of the box of ceiling tiles is 20 kg
- The boxes are not stored on pallets
- There is repetitive lifting of the boxes of ceiling tiles: there are sixty boxes in total to be lifted from the truck to the goods lift and from the goods lift to the work area on the fourth floor
- The boxes have to be carried over a long distance from the truck to the fourth floor
- There are two workers involved in this operation: one worker places the box of ceiling tiles at the edge of the truck and the other lifts from the truck and takes the boxes to the fourth floor

The information you collect at this point will be critical to understanding whether there are manual handling risk factors that need attention.

Step 3: Identify the problems or risk factors that need to be improved

The next step of the process is to identify the unfavourable ergonomic conditions or risk factors that could contribute to the risk of back injury. Schedule 3 of the Safety, Health and Welfare at work (General Application) Regulations 2007 sets out these risk factors in detail. The work activity of replacing the ceiling includes a number of unfavourable ergonomic conditions/risk factors:

- Load is too heavy to lift over a long distance
- There is over-frequent physical effort involving the spine
- Carrying and lifting distances are excessive
- The physical effort of lifting of up to sixty boxes is repetitive and too strenuous

Once the risk factors have been identified, it is necessary to investigate potential solutions.

Step 4: Agree and implement positive changes to minimise the health effects to workers

Efforts should be made to investigate whether the work activity can be organised to allow the use of mechanical or other means that avoid or reduce the need for the manual handling of loads. It is necessary to evaluate the controls that are feasible for each problem. The rationale for deciding on a control measure must be clearly documented and should outline how the suggested measure will avoid or reduce risk of injury. Consultation is necessary at this stage to ensure that all parties work together to determine whether the recommended measures are practical, to solicit feedback on other possible controls and to ensure the effective implementation of the plan of action.

A safe system of work should be detailed in Step 4 to explain the control measures. The system of work can be a combination of the following:

- o Use of handling equipment (how is it used)
- o Reorganisation of work area (what changes are made)
- o Handling techniques (how is it done)

The purpose of a safe system of work is to demonstrate evidence that appropriate measures are in place to avoid or reduce the risk of injury. The safe system of work should take account of the handling required from origin of lift to end point of lift, and the control measures should be incorporated into a manual handling training programme.

In the work activity of ceiling replacement, changes were put in place to address the unfavourable ergonomic conditions identified. These changes are detailed below:

- The ceiling tiles arrive to site on pallets and are transferred off the truck using the taillift
- The pallets are then transferred to the goods lift using a pallet truck and are transferred to the fourth floor on the goods lift
- The contractor requested a lighter ceiling tile, resulting in a lighter box weight of 17 kg

The introduction of any control measure, such as a mechanical aid or a new work layout, means the introduction of a new system of work. This new system of work must also be assessed to ensure that any new hazards are identified and controlled.



Step 5: Review

Effectiveness is the degree to which the control measures have avoided or reduced the risk of injury. Their success will depend on the timely implementation of changes and the level of worker acceptance.

The picture below shows that the pallet of ceiling tiles is transferred to the goods lift using a hand pallet truck and is then transferred to the fourth floor in the goods lift. This new system of work is the outcome of the risk assessment and it has resulted in reduced manual handling when transferring ceiling tiles from the truck to the work area on the fourth floor.

The five-step approach

- 1. Understand how the manual handling task is carried out**
- 2. Collect all the technical details**
- 3. Identify the problems or risk factors that need to be improved**
- 4. Agree and implement the positive changes to minimise the health effects to workers**
- 5. Review**

CONCLUSION

This guide is the first step towards an introduction to the management of manual handling in the construction sector. It is a baseline from which stakeholders in the construction industry can start to work together to develop best practice factsheets in order to investigate risk reduction measures for those tasks detailed in the Health and Safety Laboratory Report.

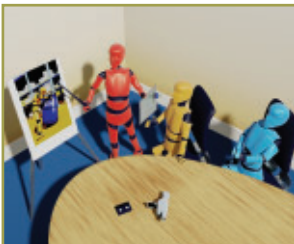


APPENDIX 1: MANUAL HANDLING RISK ASSESSMENT WORKSHEET

Step 1: How is the task carried out?



Step 2: What are the technical details of the task?



Step 3: What are the problems/risks (Refer to Schedule 3 in S.I. 299 of 2007)?



Step 4: What improvements can be made (actions that can be taken to avoid/reduce handling)?



Step 5: Are the improvements effective?





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