

Construction Hazards and Risks Control

**Lecture Title: – Comprehensive Guide to
Construction Risk Assessments & Techniques**

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**Undergraduate Diploma in
Occupational Health and Safety**

Objectives

- **Ability to organise thorough hazard identification and risk assessments in construction environments.**
- **Coordinate risk assessments to determine the level of risk associated with specific construction activities.**



Managing risks and risk assessment at Work

- Identify hazards
- Assess the risks
- Control the risks
- Record your findings
- Review the controls



Identify Hazards

- Look around your workplace and think about what may cause harm (these are called hazards). Think about:
- How people work and how plant and equipment are used
- What chemicals and substances are used
- What safe or unsafe work practices exist
- The general state of your premises



- Look back at your accident and ill health records as these can help you identify less obvious hazards. Take account of non-routine operations, such as maintenance, cleaning or changes in production cycles.
- Think about hazards to health, such as manual handling, use of chemicals and causes of work-related stress.
- For each hazard, think about how employees, contractors, visitors or members of the public might be harmed.

- Vulnerable workers
- Some workers have particular requirements, for example young workers, migrant workers, new or expectant mothers and people with disabilities.
- Talk to workers
- Involve your employees as they will usually have good ideas.

Assess the risks

- Once you have identified the hazards, decide how likely it is that someone could be harmed and how serious it could be. This is assessing the level of risk.

Decide:

- Who might be harmed and how
- What you're already doing to control the risks
- What further action you need to take to control the risks
- Who needs to carry out the action
- When the action is needed by



Control the risks

- Look at what you're already doing, and the controls you already have in place. Ask yourself:
- Can I get rid of the hazard altogether?
- If not, how can I control the risks so that harm is unlikely?



- Decide:
- Who might be harmed and how
- What you're already doing to control the risks
- What further action you need to take to control the risks
- Who needs to carry out the action
- When the action is needed by



If you need further controls, consider:

- Redesigning the job
- Replacing the materials, machinery or process
- Organising your work to reduce exposure to the materials, machinery or process
- Identifying and implementing practical measures needed to work safely
- Providing personal protective equipment and making sure workers wear it



What does reasonably Practicable mean?

- Put the controls you have identified in place. You're not expected to eliminate all risks but you need to do everything 'reasonably practicable' to protect people from harm. This means balancing the level of risk against the measures needed to control the real risk in terms of money, time or trouble



Record Your Findings

- If you have more than 5 workers, you must record your significant findings, including.
 - The hazards (things that may cause harm)
 - Who might be harmed and how
 - What you are doing to control the risks



Review the Controls

- You must review the controls you have put in place to make sure they are working. You should also review them if:
- They may no longer be effective
- There are changes in the workplace that could lead to new risks such as changes to:
 - staff
 - a process
 - the substances or equipment used
- Also consider a review if your workers have spotted any problems or there have been any accidents or near misses.

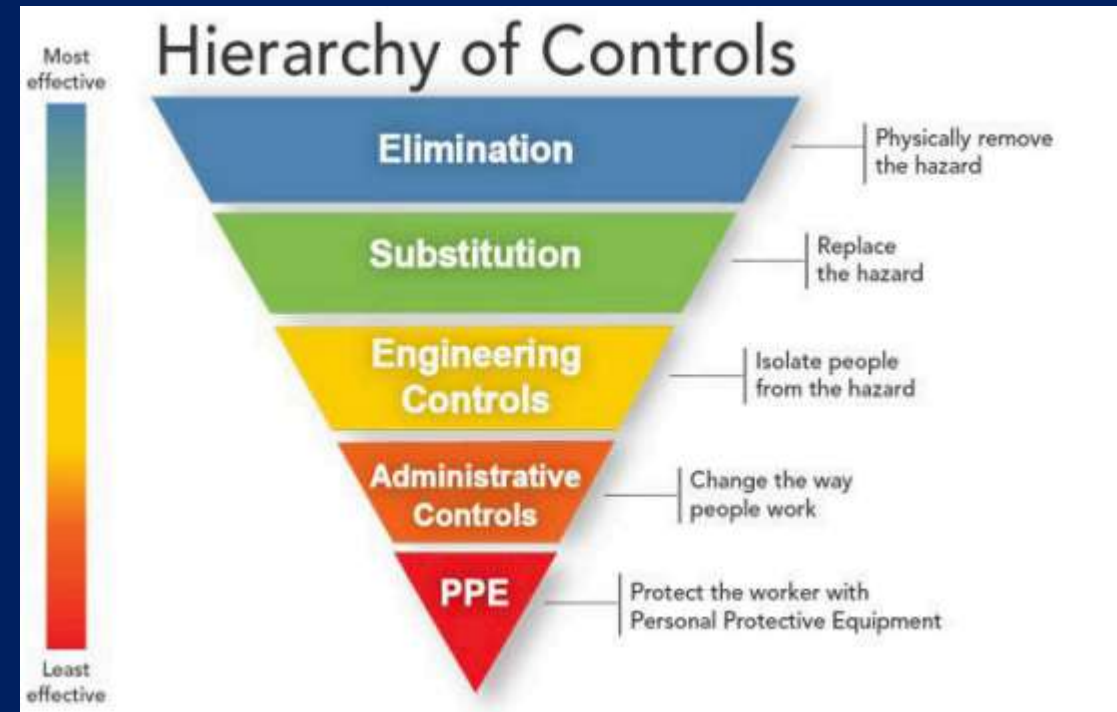


Controlling the Hazards



Hierarchy of Control

The hierarchy of controls is a method of identifying and ranking safeguards to protect workers from hazards. They are arranged from the most to least effective and include elimination, substitution, engineering controls, administrative controls and personal protective equipment.



Elimination

- Elimination makes sure the hazard no longer exists.

Examples:

- Ending the use of a hazardous material
- Doing work at ground level rather than at heights
- Stopping the use of noisy processes



Substitution

- Substitution means changing out a material or process to reduce the hazard.

Examples:

- Switching to a less hazardous material
- Switching to a process that uses less force, speed, temperature, or electrical current



Engineering Controls

- Engineering controls reduce exposure by preventing hazards from coming into contact with workers. They still allow workers to do their jobs, though.

Examples:

- Noise enclosures
- Local exhaust ventilation
- Guardrail system
- Machine guards
- Interlocks



Administrative Controls

- Administrative controls change the way work is done or give workers more information by providing workers with relevant procedures, training, or warnings. They're often used together with higher-level controls.

They include:

- Procedures, such as equipment inspections, planned preventive maintenance, checklists, lockout/tagout/tryout, infection prevention and control practices, changing work schedules, pre- and post-task reviews, and rotation of workers
- Training on topics such as hazard communication, permit-required confined space entry, lockout/tagout/tryout, and safe work procedures
- Warnings, such as signs, backup alarms, smoke detectors, computer messages, mirrors, horns, labels, and instructions



Personal Protective Equipment

- Personal protective equipment (PPE) includes clothing and devices to protect workers. PPE needs constant effort and attention (including proper use and training) from workers. Higher-level controls aren't always feasible, and PPE might be needed in conjunction with other controls
- Safety glasses
- Personal Fall Protection Systems and related equipment
- Hardhats



- Often, you'll need to combine control methods to best protect workers. For example, a local exhaust system (an engineering control) requires training, periodic inspections, and preventive maintenance (administrative controls).



EXAMPLE HAZARD: A Noisy Compressor

**MORE EFFECTIVE
CONTROLS**



**REMOVE THE NOISE
AT THE SOURCE:**



Buy a quieter
compressor

**IF YOU CAN'T REMOVE THE
NOISE AT THE SOURCE:**



Put the noisy machinery
in a separate room

OR



Use noise
absorption material

**IF RISK REMAINS, REDUCE
THE NOISE AT THE WORKER:**

Rotate noisy tasks, provide the
right hearing protection



**LEAST EFFECTIVE
CONTROLS**



HIERARCHY OF CONTROLS WORKSHEET

Remember, often a combination of controls is most effective.

Hazard or hazardous situation/activity: Driver operated fork truck struck a pedestrian in the warehouse area. There have been incidents and near misses in the past.

Control Method	New Hazard(s) Created
<p>Elimination</p> <ul style="list-style-type: none">• Design the workplace and storage at intersections to eliminate blind spots.• Only allow people to go through the warehouse if they are necessary to the operation and fork trucks are not in operation.• Don't allow anyone from other departments to go through the warehouse to break areas or the cafeteria.• Automate delivery of materials using conveyors and AGVs (automatic guided vehicles).	<ul style="list-style-type: none">• People may need to go through other hazardous areas to take inventory.

HIERARCHY OF CONTROLS WORKSHEET

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Control Method	Elimination	New Hazard(s) Created
<p>Substitution</p> <ul style="list-style-type: none"> Replace fork trucks with powered walk-beside forklifts or hand trucks. 		<ul style="list-style-type: none"> Stress on muscles.
<p>Engineering Controls</p> <ul style="list-style-type: none"> Separate vehicles and pedestrians by installing pedestrian aisles, barriers, and crossings to keep people away from fork trucks. Add mirrors to blind corners and motion detector/alarms. Limit access points to the building. Limit the speed of fork trucks. 		<ul style="list-style-type: none"> Maintenance workers have to use ladders when they clean the mirrors. Stress or exertion on workers trying to keep up with production quotas using slower equipment.
<p>Administrative Controls: Warnings</p> <ul style="list-style-type: none"> Put warning lights and backup alarms on fork trucks. Put sensors on fork trucks or pedestrians. 		<ul style="list-style-type: none"> Backup alarms add to the noise level in the warehouse. Workers can get alarm fatigue. Controls not effective for the hearing- or visually impaired.

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Control Method	Elimination	New Hazard(s) Created
<p>Administrative Controls: Procedures and Training</p> <ul style="list-style-type: none"> • Limit who has access to areas where fork trucks are in operation. • Provide forklift training with annual refreshers. • Establish a safe distance, based on manufacturer's information, around fork trucks. • Don't allow anyone to move fork trucks 15 minutes before each shift start, lunch break, or shift end. • Scheduling work so that pedestrians are not in the area of fork trucks in use. • Require the use of headlights on fork trucks at all times. • Provide training to pedestrians and operators on where the blind spots are on fork trucks. • When inventory is taken, all fork truck operations cease. 		<ul style="list-style-type: none"> • Safe distancing could impede communication between workers. • Fork truck drivers pressured to rush because of reduced time to use fork trucks.
<p>Personal Protective Equipment</p> <ul style="list-style-type: none"> • Require workers and visitors to wear high-visibility vests. 		<ul style="list-style-type: none"> • Machinery can catch loose-fitting vests.



RISK ANALYSIS MATRIX

Hazard Severity Category	Description	ACTUAL/POTENTIAL CONSEQUENCES			Probability Rating				
		Personal illness/injury	Environmental	Equipment failure; Quality Incident; cost of Loss	1 Highly unlikely	2 Unlikely	3 Possible	4 likely	5 Very likely
1	Negligible		Presents limited harm to the environment and required minor corrective action	< €1k	1	2	3	4	5
2	Slight	Minor injury requiring first aid treatment or headache, nausea, dizziness, mild rashes	Presents limited harm to the environment and requires general expertise or resources for correction.	> €1k	2	4	6	8	10
3	Moderate	Injury leading to a lost time accident or persistent dermatitis or acne	Potentially harms or adversely affects employees and the environment and requires general expertise or resources for correction.	> €5k	3	6	9	12	15
4	High	Serious injury, poisoning, sensitisation or dangerous infection	Potentially harms or adversely affects employees and the environment at our worksite. Requires specialised expertise or resources for correction	> €25k	4	8	12	16	20
5	Very High	Fatality(s). Terminal lung disease or permanent disability	Potentially harms or adversely affects the general public and has the potential for widespread public concern of operations. Can have serious economic liability on the business.	> €100k	5	10	15	20	25

PROBABILITY RATING

1. **VERY UNLIKELY** A freak combination of factors would be required for an incident to result
2. **UNLIKELY** A rare combination of factors would be required for an incident to result.
3. **POSSIBLE** Could happen when additional factors are present but otherwise unlikely.
4. **LIKELY** Not certain to happen but an additional factor may result.
5. **VERY LIKELY** Almost inevitable that an incident would result.

RISK PRIORITY CODE (RPC)

- 1-3 - **Acceptable** – Ensure controls are maintained.
- 4-7 - **Adequate** – Try to improve if reasonably practicable.
- 8-14 - **Moderate** – Introduce adequate controls to reduce the risk.
- 15-25 - **Unacceptable** – Stop works until the risk has been lowered.





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