

Construction Hazards and Risks Control

Lecture Title: – Advanced Construction Hazards & Risk Assessment Techniques

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**Undergraduate Diploma in
Occupational Health and Safety**

- **Examples of Common Construction Hazards**
- **Electrical Hazards:**
 - Electrocution from faulty wiring, exposed cables, unprotected circuits.
 - **Control Measures:** Proper insulation, regular electrical inspections, lockout/tagout (LOTO) procedures.



- **Heavy Machinery & Moving Vehicles:**
- Cranes, forklifts, trucks moving around the site pose serious risks.
- **Control Measures:** Use of spotters, site traffic management plans, and daily inspections of machinery.

**CREATE A
SPHERE
OF
SAFETY
PREVENT STRUCK-BY INCIDENTS**

Best Practices for Safe Crane Lifts

EXTEND ALL OUTRIGGERS, USE PROPER CRIBBING, AND ENSURE USE OF APPROPRIATE CHARTS TO HELP MAINTAIN STABILITY

ENSURE PROPER SLING ANGLES OF 45-60 DEGREES

ENSURE CRANE HAS ANTI-TWO BLOCK DEVICE TO PREVENT TWO-BLOCKING

USE TAG LINES AND PUSH STICKS TO KEEP THE LOAD UNDER CONTROL

NEVER STAND UNDERNEATH A SUSPENDED LOAD!

USE CLEAR SIGNALS TO COMMUNICATE WITH THE CRANE OPERATOR

SET UP BARRICADES ALL THE WAY AROUND THE CRANE

For more information on preventing struck-by incidents, visit:
www.cpwr.com/struck-by-hazards

CDC
National Institute for Occupational Safety and Health
NIOSH

NORA

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THE CENTER FOR CONSTRUCTION
RESEARCH AND TRAINING

QR code

Lifting Plan Lifting Risk Assessment

- **Hazardous Substances:**

- Exposure to asbestos, silica dust, chemicals like solvents or adhesives.

- **Control Measures:** Ventilation systems, protective clothing, asbestos abatement programs, proper labelling of hazardous materials, ensure Safety Data Sheet is at hand.



Safety Data Sheet

- [safety_data_sheets_for_hazardous_chemicals_information_sheet.pdf](#)
[\(hsa.ie\)](#)
- [Safety Data Sheets | Free SDS Database | Chemical Safety](#)



Confined Space

- Tanks, Silos, Manholes, Sewers, Trenches, Vaults, Ductwork, Pipelines, Pits and Attics.
- Control Measures: systematic approach of identifying hazards, isolating the space, gas monitoring with a calibrated gas detector, ventilation, use of appropriate PPE, permit to work system (PTW) (confined space permit), emergency response procedure, buddy system, radio communication, training, competent employees to conduct the task, etc.



Vibration

- **Vibrating tools, hand held tools, machinery and vehicles which can cause hand-arm vibration syndrome (HAVS) and whole-body vibration (WBV) related issues.**
- **HAVS from hand held tools cause, numbness, damage nerves, blood vessels, reduced grip, white finger.**
- **WBV from driving or heavy equipment can cause back pain, fatigue, gastrointestinal problem.**
- **Control measures: HAVS & WBV include eliminating or redesigning tasks, select low-vibration tools/vehicles, reduce exposure duration by job rotation and rest breaks, proper maintenance and worker training.**
- **Other hazards can be found here:**
<https://www.hse.gov.uk/construction/safetytopics/index.htm>

Legislation

- **Chapter 646 of 2024 – Health and Safety at Work Act**



- **LN 52 of 2025 - Health and Safety at Work (Minimum Health and Safety Requirements for Work at Construction Sites) Regulations**

Chapter 646 of 2024 – Health and Safety at Work Act

PART III Duties

Duties of
employers.

12. (1) It shall be the duty of an employer to ensure the physical and psychological wellbeing of his workers at all times and of all persons who may be affected by the work being carried out for such employer at their workplace.

(2) The measures that shall be taken by an employer to prevent physical and psychological ill-health, injury or death at work, shall be taken on the basis of the following general principles of prevention,

Chapter 646 of 2024 – Health and Safety at Work Act

that is:

- (a) by the avoidance of risk;
- (b) by the identification of hazards associated with work;
- (c) by the evaluation of those risks which cannot be avoided;
- (d) by the control at source of those risks which cannot be avoided;
- (e) by taking all the necessary measures to reduce risk and danger as much as reasonably practicable, according to the particular case;
- (f) by giving collective protective measures priority over individual protective measures;
- (g) by adapting the work to the worker, particularly insofar as the design of workplaces, the choice of work equipment and the choice of working and production methods are concerned, in particular with a view to alleviating monotonous work and work at a predetermined work-rate, and to reducing their effect on health;
- (h) by adapting to technical progress in the interest of health and safety at work;
- (i) by the development of a coherent overall prevention policy which covers technology, the organisation of work, working conditions, social relationships and the influence of factors related to the working environment;
- (j) by replacing the dangerous by the non-dangerous or the less dangerous; and
- (k) by giving appropriate instructions to workers.

SL 646.27 IN 52 of 2025 Duty of Contractor (RA)

(i) (i) notwithstanding anything stated in the Act or any regulations thereof, carry out or ensure that a written, suitable, sufficient and systematic risk assessment of all the occupational health and safety hazards which may be present at the construction site and the resultant risks involved concerning all aspects of the work activity in the construction site, is

HEALTH AND SAFETY AT WORK (MINIMUM HEALTH AND SAFETY REQUIREMENTS FOR WORK AT CONSTRUCTION SITES)

[S.L. 646.27 15

carried out for each project being under taken, and that all workers are informed of its contents in order to be aware of any hazards on a construction. Such assessments shall consider the risks to the health and safety of workers and of self-employed persons to which they are exposed whilst at work in a construction site, as well as the risks to the health and safety of other persons, including visitors to the construction site which risks arise out of, or in connection with the work being carried out, or by the conduct of the undertaking:

Provided that when carrying out such assessments, a contractor shall also take into consideration changes to the work activities being carried out and to the workplace, and shall take appropriate action;

SL 646.27 LN 52 of 2025 Duty of Contractor (RA)

(ii) the contractors shall keep in their possession written or retrievable electronic copies of such assessments and shall ensure that they are updated regularly;

(iii) the contractors shall decide on the protective measures appropriate to the nature of the work being carried out which are required to be taken following these assessments and, if necessary, the protective equipment to be used;

(iv) the assessments referred to in this regulation shall be reviewed whenever there is any major change in working conditions, or whenever the contractors have reason to suspect that they are no longer valid;

LN 36 of 2003 General Provisions for Health and Safety at Work Places Regulations.

10. (1) It shall be the duty of every employer and of every self-employed person to carry out, or to ensure that is carried out, a suitable, sufficient and systematic assessment of all the occupational health and safety hazards which may be present at the place of work and the resultant risks involved concerning all aspects of the work activity. Such assessments shall consider the risks to the health and safety of workers and of self-employed persons to which they are exposed whilst at work, as well as the risks to the health and safety of other persons, including

Risk assessments.

visitors to the place of work, which risks arise out of, or in connection with the work being carried out, or by the conduct of the undertaking:

Risk Assessment

- Risk assessment is the process of evaluating risks to workers' safety and health from workplace hazards. It is a systematic examination of all aspects of work that considers:
- What could cause injury or harm;
- whether the hazards could be eliminated and, if not;
- What preventive or protective measures are, or should be, in place to control the risks.



Hierarchy of Fall Protection (Q10)

A ranked or graded series of fall protection solutions ranging from the best solution to the worst. In order of best to worst, these solutions are: (Q10)

Hazard Elimination

- The preferred solution to all fall hazards is elimination.
- Can the work be done at ground level

Passive Fall Protection:

- Physical barriers like guardrails around unprotected edges and covers over holes are examples of passive fall protection

Fall Restraint:

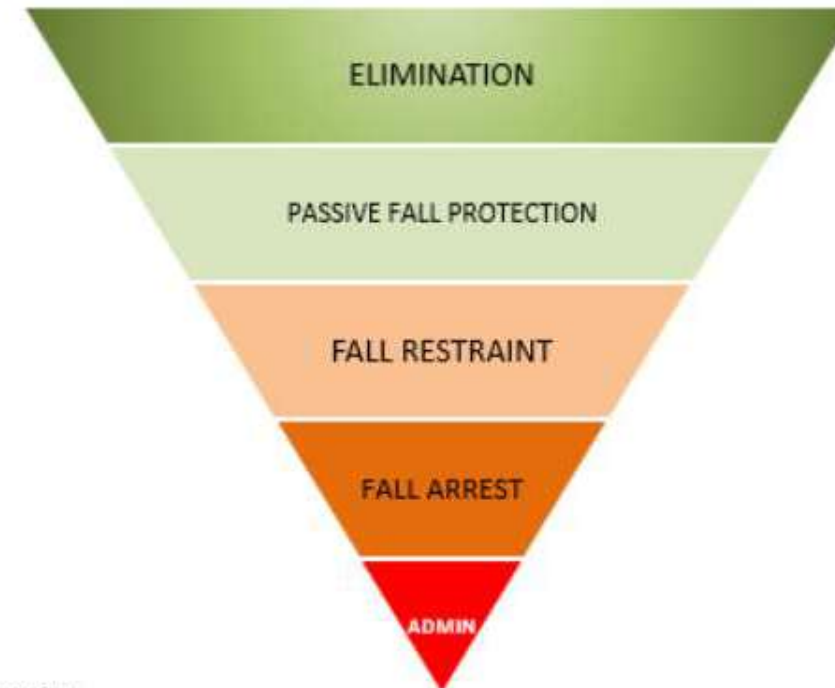
- Fall restraint systems are erected in such a manner that a fall cannot occur.
- Fall restraint systems use PPE to restrict the worker's range of movement so they cannot physically travel to the fall hazard.

Fall Arrest:

- Fall arrest systems are erected in such a manner that a fall can occur but the fall is arrested within acceptable force and clearance margins

Administrative Controls:

- Administrative controls are work practices or procedures that increase a worker's awareness of a fall hazard



Generic Risk Assessment

- A construction generic risk assessment might address common hazards like working at height, machinery operation, site traffic management, dust control, noise, vibration, etc .
- A generic risk assessment for office work might cover risks like computer-related injuries, fire safety, and general ergonomics.



Specific Risk Assessment

- Focused on specific tasks or activities, this assessment evaluates the risks associated with performing particular jobs. It examines the processes involved and identifies potential hazards linked to those tasks.

- A specific risk assessment for working with hazardous chemicals would detail the specific chemicals involved, associated health risks, necessary PPE, emergency procedures, and training requirements. (COSHH Assessment) – Control of Substances Hazardous to Health.
- A risk assessment for a construction project involving scaffolding would focus on the risks associated with scaffold erection, use, and dismantling, along with the specific training and safety measures needed.



Dynamic Risk Assessment

- This assessment is conducted in real-time, often in situations where conditions may change rapidly, such as in emergency response or when working in unpredictable environments. It allows for immediate identification and management of emerging risks.



Definitions of Suitable, Sufficient and Systematic RA

- **Suitable:** A suitable risk assessment is one that is appropriate for the specific hazards and risks present in a particular environment or task. It should take into account the unique characteristics of the workplace/ task, the tasks being performed, and the individuals involved. This means that the assessment must be tailored to effectively identify and address the risks associated with that context.



Sufficient

- A sufficient risk assessment is comprehensive enough to cover all relevant hazards and risks. It should provide enough detail to ensure that all potential dangers are identified and evaluated. This includes considering the likelihood of incidents occurring, the severity of potential outcomes, and the effectiveness of existing control measures. A sufficient assessment ensures that all necessary precautions are taken to protect health and safety.



Systematic

- A systematic risk assessment follows a structured and methodical process. This involves clearly defined steps, such as identifying hazards, assessing risks, implementing control measures, and reviewing the assessment regularly. A systematic approach ensures that no steps are overlooked and that the assessment is thorough and repeatable. It also helps in maintaining consistency in how risks are evaluated and managed over time.



Risk Matrix

- A visual tool for prioritizing risks by plotting them on a grid that considers the likelihood of an event occurring versus the severity of its consequences.

			Severity				
		Description	Very low	Low	Medium	High	Very High
Probability	Description	Rating	1	2	3	4	5
	Very likely	5	5	10	15	20	25
	Likely	4	4	8	12	16	20
	Possible	3	3	6	9	12	15
	Unlikely	2	2	4	6	8	10
	Very unlikely	1	1	2	3	4	5

Probability	
Very Likely	is expected to occur in most circumstances
Likely	Will probably occur
Possible	Might occur at some time in the future
Unlikely	Could occur but doubtful
Very/ Unlikely	This may occur in exceptional circumstances

Severity	
Very High	Fatality, permanent disability and multiple life-threatening injuries
High	Life-threatening injury or multiple serious injuries
Medium	Serious injury requires hospitalization of multiple medical treatment cases
Low	Minor injury requiring First Aid treatment
Very Low	Injury not requiring medical treatment

Risk Code	
	Unacceptable - requires an immediate action plan, task analysis or additional control measures
	Requires control of risk (ALARP)
	Acceptable - requires periodic monitoring

Risk Assessment Template Example

		Small Construction Project - Example			Date of Assessment:			DD/MM/YY		
Completed by:		Name of Assessor			Supporting Information:			Health and Safety at Work Act (1974)		
Work activity being assessed:		Insert Description of the Main processes of the project								
Persons at Risk:		Site Operatives, Visitors, General Public								
Significant Hazards	Key Task(s) & Potential Risks	Uncontrolled Risk Rating (L x S = R)			Risk Control Measures	Risk Rating with Controls (L x S = R)			Continuous Improvement Actions	
		L	S	R		L	S	R		
Slips & Trips	Risk of slips and trips from untidy work areas and poorly maintained surfaces	3	2	6	<ul style="list-style-type: none"> - Housekeeping is to be maintained at a high standard throughout the site at all times. - Waste materials should be disposed of efficiently - Suitable safety boots with non-slip soles to be worn at all times - Additionally lighting to be provided where necessary to ensure good visibility 	1	2	2		
Work at Height - Scaffolding	Risk of falls from height, resulting in serious injury/fatality Scaffolding to be erected for access to door systems on internal side of Structure – risk of falls from significant height	3	3	9	<ul style="list-style-type: none"> - Scaffolding must be installed and inspected by a competent contractor - Scaffold inspection to occur every 7 days to ensure structural integrity - Scaffold structure must not be manipulated or changed without a specific risk assessment/re-design - Any abnormalities/changes to scaffold to be reported immediately to site supervisor 	1	3	3		
Use of Mobile Elevated Working	MEWP to be used to access high-level infrastructure where scaffold is inappropriate	3	3	9	<ul style="list-style-type: none"> - Only trained & competent operator (IPAF) to use MEWP - Banksman must assist operator at all times 	1	3	3		



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