Risk Management in Construction

Health & Safety Risk Assessment in Practice

This course introduces the principles and practice of risk management in construction. It explores how to identify, assess, and control hazards on site while complying with health and safety regulations. The goal is to help students and early-career engineers develop awareness, responsibility, and sound judgment in managing workplace risks.

Course Overview

- Purpose: Understand how to identify, assess, and manage risks in construction.
- Duration: 45–60 minutes (self-paced).
- Focus: Academic insight with real-world safety applications.

Learning Outcomes

- Explain the purpose and process of risk management.
- Define hazards, risks, and controls.
- Conduct a basic health and safety risk assessment.

1. What is Risk?

Risk is the likelihood of harm or loss occurring due to exposure to a hazard. It involves uncertainty — the possibility that an event could cause injury, damage, or loss. In construction, risks relate to workers' health, public safety, environmental protection, and project outcomes.

2. Why Manage Risk?

- Prevent accidents and protect lives.
- Ensure legal compliance under the Construction Design and Management (CDM 2015) Regulations.
- Enhance safety culture and overall project performance.
- Demonstrate professional and ethical responsibility.

3. The Risk Management Process

The risk management process involves identifying potential hazards, evaluating their likelihood and severity, implementing control measures, and reviewing their effectiveness. This process is cyclical — it continues throughout the project's lifecycle.

1 Identify hazards

2 Assess likelihood and severity

3 Apply control measures

4 Review and communicate results

4. Legal Framework: CDM 2015

The Construction (Design and Management) Regulations 2015 require all parties in a construction project to eliminate foreseeable risks and, where not possible, reduce or control them. Duty holders include clients, designers, contractors, and workers. The law emphasizes coordination, communication, and competence.

5. Hazards vs. Risks

A **hazard** is a potential source of harm — for example, an unstable trench or exposed wiring. A **risk** is the chance that the hazard will cause harm, combined with the severity of that harm. **Control measures** are the steps taken to eliminate or reduce risks, such as barriers, signage, or supervision.

6. The HSE 5-Step Risk Assessment

- Identify hazards and possible outcomes.
- Decide who might be harmed and how.
- Evaluate the risk (likelihood × severity) and decide precautions.
- Record findings and communicate them to relevant parties.
- Review and update as required.

7. Evaluating Risk

Risks are often rated on a scale based on likelihood and severity. For instance, a low-likelihood but high-severity event (e.g., structural collapse) still requires significant attention. A risk matrix helps prioritize actions and allocate resources efficiently.

8. Control Measures

- Elimination – remove the hazard entirely.
- Substitution – replace with something safer.
- Engineering Controls – isolate people from hazards.
- Administrative Controls – change work practices or schedules.
- Personal Protective Equipment (PPE) – provide as a last resort.

9. Review and Residual Risk

Residual risk is the level of risk remaining after all reasonable control measures have been implemented. It must be low enough to be acceptable. Regular reviews ensure that controls remain effective as site conditions or activities change.

10. Example: Risk Assessment Table

Activity	Hazard	Persons at Risk	Controls	Residual Risk

Excavation	Collapse of sides	Workers in trench	Shoring, supervision, training	Low

11. Common Mistakes in Risk Management

- Using generic templates without site-specific details.
- Failing to consider dynamic or evolving site conditions.
- Ignoring residual risks or neglecting follow-up reviews.

12. Key Takeaways

- Risk management is proactive, not reactive.
- Effective communication is as vital as technical control.
- Health and safety are integral to engineering excellence.

“Good safety is good engineering.”
— Damilola Bashir Akinniyi
Geotechnical Engineer, Researcher & Higher Education Professional