Construction Hazard and Risk Control

Lecture Title: Construction sites issues and controls

Lecturer: Josette Cutajar

Date: 12th & 19th November 2025

Undergraduate Diploma in Occupational Health and Safety

This lecture covers the following learning objectives:

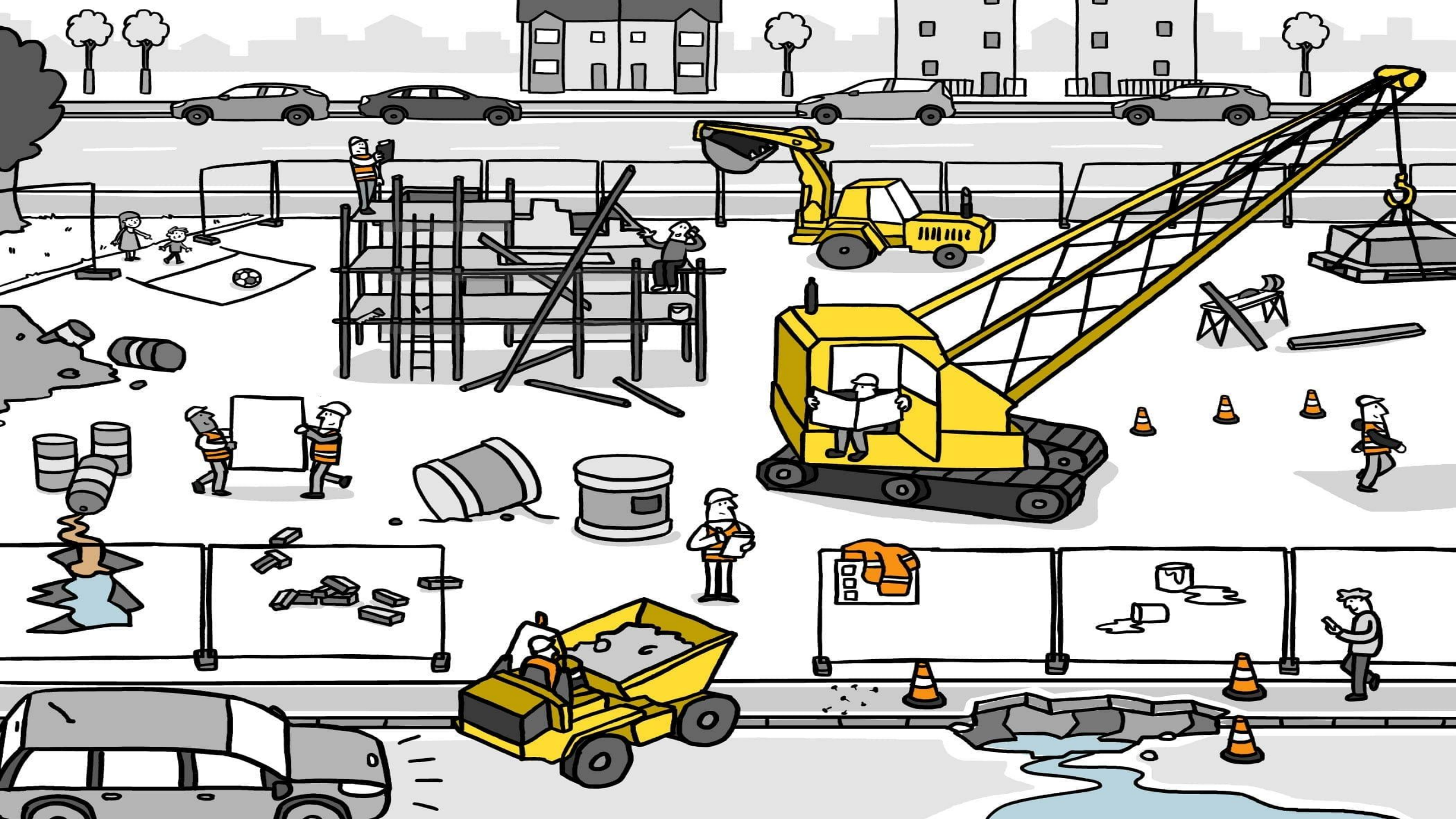
- Identify the health, welfare and work environment requirements on construction sites
- Explain the hazards and appropriate control measures for violence at work

Initial site assessment

Principal health and safety issues on construction sites:

<u>These include:</u>

- safe place of work protection against falls
- fragile roofs
- protection from falling objects
- working over near water
- vehicles and traffic routes
- fire and other emergencies
- electricity
- noise and vibration
- health hazards
- excavations
- demolition.



Main Causes to facilities

- falling through fragile roofs and roof lights;
- falling from ladders, scaffolds and other workplaces;
- being struck by excavators, fork-lift trucks or dumper trucks;
- overturning vehicles;
- being crushed by collapsing structures.

Initial site assessment

This will involve knowledge of the previous and current use of the site:

- A survey of the topography of the site required, including the ground conditions, ground stability and type of ground or soil
- Area and access to the site, particularly for vehicles
- If demolition and/or refurbishment involved, a structural survey should be made of the building (see next section)
- Other activities on the site?
- Will hot work permits be required?
- Presence of overhead and underground services
- Emergency evacuation possible

Initial site assessment- Nature of the surroundings to the site

- the proximity of roads, footpaths,
- the details of any fencing or hedging and general vegetation
- the position and description of any trees which need to be felled and those which must be untouched
- the proximity of residential, commercial or industrial properties
- the proximity of schools, hospitals and playing fields
- the presence of overhead power lines and details of the responsible authority
- the availability of services, such as electricity, telephone lines and water and drainage systems
- any evidence of fly tipping or other unauthorised activity
- measures required to prevent unauthorised access by vehicles.

Appropriate general site controls and facilities- Site Planning

The essential elements are:

- site layout;
- location of access and egress points to a site;
- safe access for pedestrians and vehicles, including emergency services;
- separation of vehicles and pedestrians on site;
- suitable areas for parking, loading and unloading;
- method statements and risk assessments;
- adequate lighting throughout the site;
- suitable health and safety, warning or directional signs;

Appropriate general site controls and facilities- Site Planning

The essential elements are:

- areas for site offices, materials and machinery storage;
- welfare facilities for the workforce;
- arrangements for site management and control, including inspection procedures and workforce supervision;
- arrangements for fire and other emergencies and accident reporting;
- the development of hot work permits, provision of fire-fighting equipment and suitable storage facilities for flammable substances

Appropriate general site controls and facilities- Site Planning

Preparation of site waste management plans; and arrangements for the disposal of any waste, to include:

- clear identification
- secure storage
- transferred only to an authorised person
- adequate records kept.

Every construction site must have a first-aid box and eye wash facilities. A small first-aid kit must be given to lone workers on remote sites.

Waste skip selection

- sufficient strength to cope with its load;
- stability while being filled;
- a reasonable uniform load distribution within the skip at all times;
- the immediate removal of any damaged skip from service and the skip inspected after repair before it is used again;
- sufficient space around the skip to work safely at all times;
- the skip should be resting on firm level ground;
- the skip should never be overloaded or overfilled; and
- there must be sufficient headroom for the safe removal of the skip when it is filled.

Demolition or refurbishment projects

- For these projects, hazards associated with structural collapse, fire, working at height, lifting and carrying and electricity must be considered together with health hazards from lead, asbestos, vermin and insects.

- The client must provide the principal contractor with relevant information about the building structure, including its stability and structural form and any significant design assumptions

Demolition or refurbishment projects

A structural survey before work commences should reduce the risk of unintentional structural collapse. Such a survey should be undertaken by a competent person before any potentially load-bearing parts of a structure are altered. The structural survey should consider:

- the age of the structure;
- previous use;
- type of construction; and
- any nearby buildings or structures

A competent person should decide the method and design of temporary supports. Temporary support provided must be designed, installed and maintained to withstand foreseeable loads and structures should never be overloaded

2 Site preparation

This could involve:

- specialist activities – lifting piling or steelwork;
- removal or de-branching of trees using chainsaws and a wheeled excavator to remove roots;
- removal of contaminated topsoil; and
- arrangements to deal with high-voltage overhead power lines.

3 Site security and protecting the public

The client's pre-construction information should include:

- project boundaries;
- adjacent land use;
- access; and
- measures to exclude unauthorised people.

3 Site security and protecting the public

1. the erection and maintenance of a strong perimeter fence and a lockable gate;
2. the protection of members of the public, including trespass by children, by:

- the removal of access ladders
- providing trench supports
- covering holes where possible
- immobilising plant
- safe stacking of materials
- locking away dangerous chemicals
- isolating electrical supplies, and
- locking off fuel storage tanks

3 Site security and protecting the public

- the provision of warning signs at the perimeter fence and suitable viewing points for the public to observe the construction work safely;
- the secure storage of cement, which is a hazardous substance, in a dry store;
- the storage of gas cylinders, fuel and other flammable substances in a separate flameproof store; and
- the control of excessive noise, dust and mud on the public roads

3 Site security and protecting the public

Ensure the safe passage of vehicles and pedestrians by:

- the erection of warning signs
- the use of cones with lead-in and exit tapers and an indication of a safety zone between the cones and the work area
- the possible use of barriers and lighting for pedestrian safety
- the possible use of traffic lights or stop/go boards to control traffic; and
- informing certain neighbours, such as schools, hospitals or factories, of the timing of some aspects of the work

4 Site induction training topics

- outline of the project;
- site health and safety policy;
- site welfare facilities;
- site health and safety plans;
- those site method statements which are relevant to the workers at the induction;
- the findings of any relevant risk assessments;

4 Site induction training topics

- details of any hazardous operations, such as work at height, site vehicular movement and confined space working;
- manual handling procedures and precautions;
- accident reporting procedures and first-aid arrangements;
- emergency procedures, including fire precautions, emergency telephone numbers and assembly points;
- the site rules; and
- the managerial and consultation arrangements on site, including the identity of the supervisor

Summary of a safe place of work for a construction site

- secure and locked gates with appropriate notices posted;
- a secure and undamaged perimeter fence with appropriate notices posted;
- all ladders either stored securely or boarded across their rungs;
- all excavations covered
- all mobile plant immobilised, where practicable, and services isolated;
- secure storage of all inflammable and hazardous substances;
- visits to local schools to explain the dangers present on a construction site; and
- if unauthorised entry persists, then security patrols and closed circuit television may need to be considered

Hazards and control measures for works of a temporary nature

- slips, trips and falls are a frequent source of injury to members of the host organisation and the public;
- unfenced excavations;
- inadequate protection of holes, uneven surfaces, poor reinstatement, trailing leads and cables (especially on stairways), spillage of oils and gravel;
- poor lighting and ventilation in and around the temporary works

Hazards and control measures for works of a temporary nature

- noise and vibration;
- hazardous substances including dust;
- falling or flying objects;
- the accumulation of waste materials;
- falling or moving objects;
- poor storage of materials and equipment and other obstructions in public areas, including inadequate control of waste materials, are common causes of accidents;

Hazards and control measures for works of a temporary nature

- fire and/or explosions;
- lack of project management and supervision;
- hazards created outside the site perimeter (for example, unloading materials from a delivery lorry outside the perimeter);
- presence of asbestos; and
- demolition work

Principal control measures are

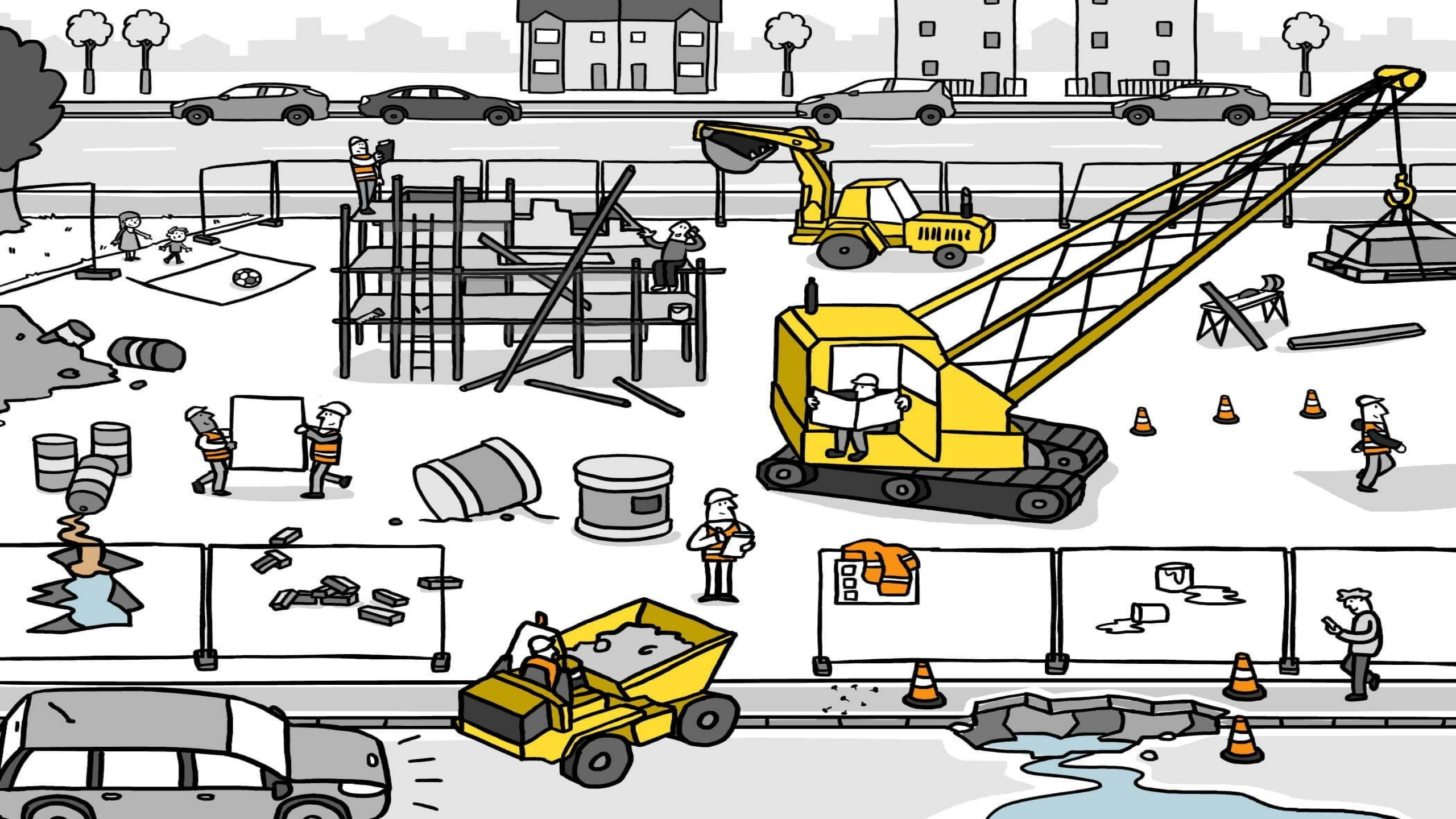
- the appointment of a Temporary Works Coordinator to oversee the project and to sign it off on completion;
- good cooperation between the contractors and host employees;
- a comprehensive risk assessment for the project;
- good management and supervision of the project;
- good communication between clients, contractors and residents;
- the provision of welfare facilities including first-aid arrangements; and
- the possible segregation of work areas or access to them controlled by physical barriers or warning signs

Additional controls may include

- covering or fixing of any trailing cables that cross pedestrian areas;
- provision of lighting at night and in dark areas;
- prompt removal of all waste and rubbish;
- protection of vulnerable groups such as the elderly, children and people with certain disabilities;
- provision of suitable protection from dust, asbestos fibres, noise and vibration; and
- posting of warning signs around the site and at all entrances to the main building

The risk assessment should include the identification of:

- all aspects of the works including the health and safety implications to the host employees and the contractors;
- the people at risk from the work including, where appropriate, members of the public; and
- any risks to the contractors from the business of the host organisation



Health, welfare and work environment requirements

Welfare and work environment issues are covered by the Workplace (Health, Safety and Welfare) Regulations.

Welfare facilities include:

- the provision of sanitary conveniences;
- washing facilities (including showers if necessary);
- an adequate supply of drinking water;
- accommodation for changing and storage of clothing;
- facilities for rest and eating meals at break times;
- adequate first-aid provision (an accident book); and
- protective clothing against adverse weather conditions

Drinking water

- Accessible to all the workforce.
- The supply of drinking water must be adequate and wholesome.
- Normally mains water is used and should be marked as ‘drinking water’ if water not fit for drinking is also available.
- On some sites, particularly during the early stages of construction, it may be necessary to provide bottled water or water in tanks. In this event, the water should be changed regularly and protected from contamination.
- Cups or mugs should be available near the tap unless a drinking fountain is provided.

Facilities for rest and eating meals

Facilities for rest and eating meals must be provided so that:

- workers may sit down during break times in areas where they do not need to wear personal protective equipment;
- workers can make hot drinks and prepare food;
- facilities are provided for pregnant women and nursing mothers to rest; and food is not contaminated by hazardous substances.

The welfare facilities
Should be located:

- adjacent to each other; and
- as close to the main working area as possible

Exposure to inclement weather

	Health effects	Preventative measures
High temperatures	Heart strain Heat stroke	Supply of drinking water Supply of ventilated air Regular health surveillance Information and training on the hazards
Low temperatures	Frostbite Loss of limbs	Supply of thick, warm (thermal) clothing Provision of hot drinks and external heating Regular health surveillance Information and training on the hazards

Violence at work

Defined as any incident in which a person is abused, threatened or assaulted in circumstances related to their work. High-risk occupations include health and social services, police and firefighters, lone and night workers and benefit services.

Workers who are most at risk from violence are those that:

1. handle money;
2. provide a service to the public (such as shop workers, teachers and nurses);
3. are lone workers;
4. represent authority (such as police, traffic wardens and even school crossing patrols).

Violence at work

Many people resort to violence due to frustration. Common causes of such frustration are the following:

- dissatisfaction with a product or service, including the cost;
- a perception of being unreasonably penalised over an incident such as car parking; and
- a general lack of information following a problem, such as aircraft delays or long delays at hospitals.
- In over a third of the incidents, the victim believed the offender was under the influence of alcohol, and in nearly a fifth of incidents under the influence of drugs.

Types of security equipment used

1. access control (swipe cards and simple coded security locks);
2. closed circuit television (CCTV);
3. alarms – there are three main types:

- intruder alarms
- panic alarms; and
- personal alarms
- radios and other devices (particularly for lone workers); and
- mobile phones

Substance misuse at work

Risks to health and safety of drugs and alcohol

- reduce productivity;
- increase absenteeism;
- increase accidents at work; and, in some cases,
- endanger the public.

Alcohol and solvent abuse is a considerable problem when vehicle driving is part of the job, especially if driving is required on public roads

Controls for alcohol abuse:

- during working hours, there should be no drinking
- drinking during break periods should be discouraged
- induction training should stress this policy
- managers should enforce the policy
- posters can also help to communicate the message
- the availability of a confidential counselling service

Drug Abuse:

Drug abuse presents similar problems to those found with alcohol abuse:

- absenteeism
- reduced productivity
- an increase in the risk of accidents
- impairments in cognition, perception and motor skills

Signs of a substance misuse problem

- sudden mood changes
- unusual irritability or aggression
- a tendency to become confused
- abnormal fluctuations in concentration and energy
- impaired job performance
- poor time-keeping
- increased short-term sickness leave
- a deterioration in relationships with colleagues, customers or management
- dishonesty and theft (arising from the need to maintain an expensive habit)

A policy on drug abuse can be established by:

1. **Investigation of the size of the problem.**
2. **Planning actions** – develop an awareness programme for all staff and a special training programme for managers and supervisors.
3. **Taking action** by producing a written policy to include:

- details of the safeguards to employees
- the confidentiality given to anyone with a drug problem
- the circumstances in which disciplinary and/or reported action will be taken.

4. Monitoring the policy by checking for positive changes in the measures made during the initial investigation (improvements in the rates of sickness and accidents

Safe movement of people on construction sites

Hazards to pedestrians include:

- slips, trips and falls on the same level
- falls from height
- collisions with moving vehicles
- being struck by moving, falling or flying objects
- striking against fixed or stationary objects
- treading on sharp items

Trip hazards are caused by:

- loose floorboards or carpets
- obstructions, low walls, low fixtures on the floor
- cables or trailing leads to portable electrical hand tools and other electrical appliances across walkways
- raised telephone and electrical sockets
- rugs and mats – particularly when worn or placed on a polished surface
- poor housekeeping – obstacles left on walkways, rubbish not removed regularly
- poor lighting levels – particularly near steps or other changes in level
- sloping or uneven floors – particularly where there is poor lighting or no handrails
- unsuitable footwear – shoes with a slippery sole or lack of ankle support

Slip hazards are caused by

- wet or dusty floors
- the spillage of wet or dry substances – oil, water, plastic pellets
- loose mats on slippery floors
- wet and/or icy weather conditions
- unsuitable footwear, floor coverings or sloping floor

Control strategies for pedestrians

- risk assessment to identify suitable controls
- slip-resistant surfaces and reflective edges to stairs and kerbs
- spillage control and drainage
- designated walkways
- fencing and guarding, particularly on stairways
- use of warning signs
- sound storage racking that is inspected and maintained regularly
- maintenance of a safe workplace
- cleaning and good housekeeping procedures

Permanent staircases

Permanent staircases are a source of falls from a height and the following design and controls should be considered:

- adequate width of the stairway and depth of the tread;
- provision of landings and banisters or handrails and intermediate rails;
- provision of non-slip surfaces and reflective edging;
- adequate lighting;
- adequate maintenance;
- special or alternative provision for disabled people.

Hazards and the associated controls to the general public in construction activities

Main hazards:

- materials falling from working platforms
- striking against fixed or stationary objects
- trespass by children
- collision with vehicles
- operation of cranes and other lifting equipment

Common control measures

- posting of various warning signs
- provision of clearly defined and protected thoroughfares
- separate entrances for people and vehicles
- provision of 2 m high perimeter fence, with no clearance at ground level
- adequate lighting
- good housekeeping by ensuring that all waste debris and construction materials, particularly timber, is safely stored and/or removed from the site
- the use of appropriate personal protective equipment
- remove all protruding nails or screws or flatten against the timber
- security guards and/or cameras required on sites which are particularly vulnerable to trespassers

21 ACADEMY

Undergraduate Diploma in Occupational Health and Safety