

Occupational Health and Safety in Construction Industry (Continued)

Setting up the site

Site access

There should be safe access onto and around the site for people and vehicles. Plan how vehicles will be kept clear of pedestrians, especially at site entrances where it may be necessary to provide doors or gates to achieve this segregation. Doors that open onto traffic routes may need viewing panels or windows.

Your plan should include how vehicles can be kept clear of pedestrians at vehicle loading/unloading areas, parking and manoeuvring places and areas where drivers' vision may be obstructed.

Site boundaries

Construction work should be fenced off and suitably signed. This will protect people (especially children) from site dangers and the site from vandalism and theft. For some jobs the workplace will have to be shared. Perhaps the work will be done in an operating factory or office. Agree who has to control each area. Agree what fences, barriers, means of separation or permits to work are required to keep both construction workers away from hazards created by others and other people away from hazards created by the construction work; site rules might be needed. Make sure there is a system to ensure necessary precautions are kept in place during working hours and that nighttime and weekend protection is put in place as required before the site closes.

Welfare facilities

Everyone who works on any site must have access to adequate toilet and washing facilities, a place for preparing and consuming refreshments and somewhere for storing and drying clothing and personal protective equipment.

Principal contractors and others who have control over construction sites are responsible for providing or making available site welfare facilities. Employers are also responsible for ensuring that welfare facilities are adequate for their employees.

The welfare facilities should be sufficient for everybody who is working on the site. If facilities such as toilets and canteens provided by someone else are to be used, check that they are suitable and properly maintained. They should be kept clean, warm and properly ventilated and lit.

Welfare facilities should be easily available to people working on the site. Toilets need to be easily accessible from where the work is being done. Washing facilities should be as close as possible to the toilets. Washing facilities also need to be close to canteens and rest rooms so that people can wash before eating.

In almost all cases, these facilities will be provided on site. Where the work is of short duration, arrangements still need to be made for welfare facilities.

If mobile gangs are employed to work at a number of locations over a few days (eg road repair and cable-laying gangs), facilities can be provided at a central location. This is on condition that they are available to workers within reasonable walking distance or within a reasonable time, taking into account the available transport. Workers should not be left to make their own arrangements on an 'as and when required' basis.

Sanitary conveniences

The numbers of toilets required will depend on the number of people working on the site. Wherever possible toilets should be flushed by water and connected to a mains drainage system. If this is not possible, toilets with a built-in water supply and drainage tank may be provided. If neither option is possible, chemical toilets may be provided. Figure below shows a self-contained water-flushing toilet block with built-in tank.

Men and women may use the same toilet, provided it is in a separate room with a door that can be locked from the inside.

A washbasin with water, soap and towels or dryers should be located close to the toilets.

Washing facilities

On all sites, provide basins large enough to allow people to wash their faces, hands and forearms (see Figure below). All basins should have a supply of clean hot and cold, or warm, running water. If mains water is not available, water supplied from a tank may be used.



A self-contained water-flushing toilet block with built-in tank



Washbasin large enough for people to wash their forearms

Soap and towels (either roller-type cloth or paper) or dryers should also be provided. It is good practice to provide skincare products.

Where the work is particularly dirty or workers are exposed to toxic or corrosive substances (eg during demolition or work in contaminated ground), showers should be provided.

Men and women can share basins used for washing their faces, hands and arms.

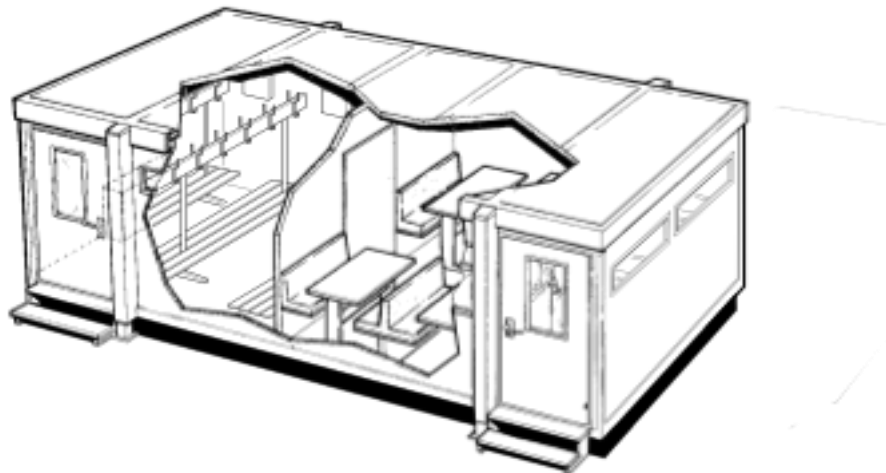
A shower may be used by both men and women provided that it is in a separate room with a lock on the inside of the door.

Rest facilities

Facilities should be available for taking breaks and meal breaks (see Figure below). The facilities should provide shelter from the wind and rain and be heated as necessary.

The rest facilities should have:

- tables and chairs;
- a kettle or urn for boiling water;
- a means of heating food (eg a gas or electrical heating ring, or microwaveoven).



A welfare unit with a rest area and drying room

It should be possible for non-smokers to use the facilities without suffering discomfort from tobacco smoke. This can be achieved by providing separate facilities for smokers and non-smokers, or by prohibiting smoking in the rest facilities.

For small sites, rest facilities can often be provided within the site office or site hut, especially where this is one of the common portable units.

Remember, open-flued gas heaters and gas cooking rings can produce carbon monoxide if there is inadequate ventilation. When poorly maintained, they also give rise to leaks of methane which can ignite or explode without warning. Gas appliances should not be used in site huts, containers or other enclosed areas unless there are vents or louvres that give a permanent supply of fresh air that cannot be closed off (a window that can be opened is not adequate as it is likely to be closed in cold weather). LPG cylinders must be stored in the open air, if necessary locked cages may be used to secure them.

Storing and drying clothing and personal protective equipment

Make sure there are proper arrangements for storing:

- clothing not worn on site (eg hats and coats);
- protective clothing needed for site work (eg Wellington boots, overalls, gloves etc);
- personally issued equipment (eg ear defenders, goggles, harnesses etc).

Separate lockers might be needed, although on smaller sites the site office may be a suitable storage area, provided it is kept secure. Where there is a risk of protective site clothing contaminating everyday clothing, store items separately.

Where necessary for propriety, men and women should be able to change separately.

A drying area should be provided to dry wet site clothing. This area should be separated from the eating area (see Figure above).

If electrical heaters are used, ensure that they are either fitted with a high- temperature cut-out device or are properly ventilated. Many fires have been caused by placing clothing on electrical heaters to dry, making the appliance overheat.

Drinking water

Make sure there is a supply of drinking water. It is best if a tap direct from the mains is available, otherwise bottles or tanks of water may be used for storage. If water is stored, it should be protected from possible contamination and changed often enough to prevent it from becoming stale or contaminated.

The tap should be clearly marked if it is possible to confuse the drinking water supply with other water supplies or other liquids such as:

- those not fit for consumption (eg water from storage tanks used for wheel washers); or
- certain toxic materials (eg from taps to pipelines in factories).

Cups or other drinking vessels should be available at the water tap, unless the water is supplied as an upward jet that can be drunk from easily (eg a drinking fountain).

Good order, storage areas and waste materials

Plan how the site will be kept tidy and how housekeeping will be actively managed:

- keep walkways and stairways free of tripping hazards such as trailing cables, building materials and waste. This is especially important for emergency routes. Make sure that all flammable waste materials (such as packaging and timber offcuts) are cleared away regularly to reduce fire risks;
- keep inside floor areas clean and dry;
- outdoor footpaths should be level and firm and should not be used for storing materials.

Designate storage areas for plant, materials, waste, flammable substances (eg foam plastics, flammable liquids and gases such as propane) and hazardous substances (eg pesticides and timber treatment chemicals). Flammable materials will usually need to be stored away from other materials and protected from accidental ignition. Do not store materials where they obstruct access routes or where they could interfere with emergency escape, eg do not store flammable materials under staircases or near to doors or fire exits (see Figure below).



A designated timber storage area

If materials are stored at height (eg on top of a container or on a scaffold gantry), make sure necessary guard rails are in place if people could fall when stacking or collecting materials or equipment.

Keep all storage areas tidy, whether in the main compound or on the site itself. Try to plan deliveries to keep the amount of materials on site to a minimum.

Decide how the waste stream will be managed to ensure it is timely and effective. You might want to consider whether you will require the contractors to be responsible for collecting their own waste or whether you will provide someone to do this for the site. Don't forget that waste materials also need storing safely before their removal from the site and make sure that you allow sufficient space for waste skips and bins. If you are collecting waste in skips you will need to decide where the skips can be positioned and how often they will need to be collected (see Figure below). Consider waste generated inside and whether you need to provide wheeled bins to enable it to be brought out of the building safely.

Lighting

Every part of the site that is in use should, as far as possible, be arranged so that natural light is available for people to see to do their work and move about the site safely. Where natural light is inadequate or not available, artificial lighting should be provided.

Where work will continue outside daylight hours or the building or structure is enclosed, artificial lighting will be required. Make sure that any artificial lighting does not change the apparent colour or visibility of any safety signs or other safety-related items such as fire extinguishers.

With both daylight and artificial light, shadows can obscure hazards both at the workplace (eg

making it difficult to see the blade of a cutting disc or a drill bit) and on the site generally (eg at stairwells). If necessary, provide extra lighting to illuminate shadow areas.

Where failure of the primary artificial lighting would be a risk to the health or safety of anyone (eg someone working on a tower scaffold in a basement may fall while trying to descend in the dark), provide emergency lighting. Where it is not possible to have lighting that comes on automatically when the primary lighting fails, torches or other similar lights may provide suitable lighting.

In addition, emergency routes (the corridors, passageways etc that people must follow in an emergency to escape from danger) should be kept well lit while there are workers on the site. Where daylight provides adequate lighting, no further action is required. Where emergency routes need artificial light, provide emergency lighting that comes on if the primary lighting fails (eg battery or emergency generator-powered lighting). Emergency lighting does not have to provide the same level of lighting as under normal circumstances; merely enough to enable escape.



A designated waste collection area

Emergency procedures

At most sites, the most obvious emergency is fire. The general principles for dealing with fire risks are considered in greater detail in paragraphs below. These general principles can be applied to planning for other emergencies, such as flooding in excavations, tunnels, work near the sea or rivers, waterworks etc, or a risk from asphyxiation or toxic gases. Plan emergency procedures before work begins and put general precautions in place from the start of work.

Some emergencies may require evacuation of the site or part of the site, while others might involve the rescue of an injured person. For example, it may be necessary to plan how someone injured in a fall within a confined space or within a restricted plant room can be attended to by first aiders and the emergency services before being taken to a place of safety.

Planning for an emergency

When planning emergency procedures, routes and exits, take into account:

- the type of work being done on site (eg extra precautions may be required to maintain routes down stairs during demolition);
- the characteristics and size of the site and the number and location of workplaces on the site;
- A large site with people working at many locations will probably need bells or sirens at a number of places to raise the alarm. On small sites with only two or three people working, an air horn may be adequate;
- the plant and equipment being used (eg consider tower crane drivers, people working on suspended access equipment or where the exit may be obstructed by equipment);
- the number of people likely to be present on the site at any one time. On sites where many people work, escape routes need to be wide enough to allow everyone to get through doorways or down stairs easily without them becoming overcrowded; and
- the physical and chemical properties of substances or materials on or likely to be on the site (eg work at petrochemical installations or at sites where flammable paints or glues are in use may require an increased standard of ventilation).

Take precautions to ensure:

- the likelihood of emergencies arising is as low as possible;
- everyone on site can be alerted in an emergency;
- everyone working on site (including contractors who may only be at the site for a few hours) knows what signal will be given if there is an emergency and
- knows what to do;
- someone who has been trained in what to do is on site while work is in progress and will take responsibility for co-ordinating procedures;
- emergency routes are available, kept clear, signed and adequately lit. When
- the site is not adequately lit by daylight for all periods when people are at work,
- provide lighting that will come on automatically in an emergency;
- there are arrangements for calling the emergency services. It is good practice
- to let the Fire Brigade know about any work in tunnels, confined spaces or above 18 m (above this height they may require specialist access equipment) and anywhere else where specialized rescue equipment may be needed;

- there is adequate access to the site for the emergency services and that access does not become blocked by plant or material building up;
- arrangements for treating and recovering injured people are available;
- if an emergency does arise, someone is posted at the site entrance, or in another prominent position, so that they can direct the emergency services.

Fire

Many solids, liquids and gases can catch fire and burn. It only takes a source of ignition, which may be a small flame or an electrical spark, together with air. Any outbreak of fire threatens the health and safety of those on site and will be costly in damage and delay. It can also be a hazard to people in surrounding properties. Fire can be a particular hazard in refurbishment work when there is a lot of dry timber and at the later stages of building jobs where flammable materials such as adhesives, insulating materials and soft furnishings are present.

Many fires can be avoided by careful planning and control of work activities. Good housekeeping and site tidiness are important not only to prevent fire, but also to ensure that emergency routes do not become obstructed. Making site rules can help.

Precautions to prevent fires

The following precautions should be taken to prevent fires:

- use less-easily ignited and fewer flammable materials, eg use water-based or low-solvent adhesives and paint;
- keep the quantity of flammables at the workplace to a minimum;
- always keep and carry flammable liquids in suitable closed containers;
- if work involving the use of flammable materials is being carried out, stop
- people smoking and don't allow other work activities involving potential ignition sources to take place nearby. For example, if floor coverings are being laid using solvent-based adhesives, don't allow soldering of pipes at the same time;
- ensure that pipes, barrels, tanks etc which may have contained flammable gases or liquids are purged or otherwise made safe before using hot cutting equipment, such as a cutting torch or angle grinder. A pipe or container may appear to be empty, but can contain enough material on its sides, or within rust or other sediments, to produce a flammable or explosive atmosphere within it when heated or disturbed. Specialist advice may be required;
- to minimize the risk of gas leaks and fires involving gas-fired plant:
 - close valves on gas cylinders when not in use;
 - regularly check hoses for wear and leaks;
 - prevent oil or grease coming into contact with oxygen cylinder valves;
 - do not leave bitumen boilers unattended when alight;
- store flammable solids, liquids and gases safely. Separate them from each other and from

oxygen cylinders or oxidizing materials. Keep them in ventilated secure stores or an outdoor storage area. Do not store them in or under occupied work areas or where they could obstruct or endanger escape routes;

- have an extinguisher to hand when doing hot work such as welding or using a disc cutter that produces sparks;
- check the site at lunchtime and at the end of the day to see that all plant and equipment that could cause a fire is turned off. Stop hot working an hour before people go home, as this will allow more time for smouldering fires to be identified; and
- provide closed metal containers to collect rubbish and remove them from the site regularly. Collect highly flammable waste such as solvent-soaked rags separately in closed fire-resisting containers.

Precautions in case of fire

If a fire should break out, people must be able to escape from it. To achieve this consider the points in paragraphs below..

Means of giving warning

Set up a system to alert people on site; this could be a temporary or permanent mains operated fire alarm (which should be tested regularly, eg weekly), a klaxon, an air horn or a whistle, depending on the size and complexity of the site. Any warning needs to be distinctive, audible above other noise and recognizable by everyone.

Means of escape

Plan escape routes and ensure they remain available and unobstructed. For work areas above or below ground, provide well separated alternative ways to ground level where possible. Protect routes by installing the permanent fire separation and fire doors as soon as possible. It is important that escape routes give access to a safe place where people can assemble and be accounted for. In a large chemical plant this may be a safety refuge, while on a small site the pavement outside may be adequate. Signs will be needed if people are not familiar with the escape routes (see Figure below). Make sure that adequate lighting is provided for enclosed escape routes – emergency lighting may be required ;



An example of an emergency exit sign

Means of fighting fire

As well as providing fire extinguishers for hot work, fire extinguishers should be located at

identified fire points around the site. The extinguishers should be appropriate to the nature of the potential fire:

- wood, paper and cloth – water extinguisher;
- flammable liquids – dry powder or foam extinguisher;
- electrical – carbon dioxide (CO₂) extinguisher.

Nominated people should be trained in how to use extinguishers.

If the building being worked in is occupied (eg an office, hotel or hospital), make sure the work does not interfere with the escape route from the building, or any fire separation, alarms, dry risers, or sprinkler systems. Check this with the building occupier or the Fire Brigade.

Fire doors should never be locked, left open or removed. Keep existing wet and dry risers ready for use and install any new ones as soon as possible.

First aid

First aid can save lives, reduce pain and help an injured person make a quicker recovery. The Health and Safety (First Aid) Regulations require you to provide adequate and appropriate equipment, facilities and personnel to enable first aid to be given to your employees if they are injured or become ill at work. The minimum provision for all sites is:

- a first aid box with enough equipment to cope with the number of workers on site;
- an appointed person to take charge of first-aid arrangements;
- information telling workers the name of the appointed person or first aider and
- where to find them. A notice in the site hut is a good way of doing this.

An appointed person is someone you choose to take charge when someone is injured or falls ill and who will telephone for an ambulance if one is required. An appointed person should not attempt to give first aid for which they have not been trained.

A first aider is someone who has undergone a training course in administering first aid at work and holds a current first aid at work certificate. A first aider can undertake the duties of an appointed person. The number of qualified first aiders needed depends on the risk of injury and ill health on site. As a guide:

Numbers employed at any location	Number of first aid personnel
Fewer than five	At least one appointed person
5 to 50	At least one first aider
More than 50	One additional first aider for every 50 employed

The first-aid arrangements should cover shift working, night and weekend working where this is carried out. This may mean appointing or training several people to ensure adequate cover.

Reporting injuries, diseases and dangerous occurrences

Employers have a duty under the law to report certain types of accidents that happen to their employees. Whoever is in control of the site also has a legal obligation to report certain accidents which involve a self-employed worker or member of the public and certain dangerous occurrences.

Generally, you have to report deaths, serious injuries and dangerous occurrences immediately and less serious injuries within ten days. Certain occupational ill-health issues and diseases also have to be reported.

Site rules

Clients may insist on certain safety precautions, especially where their business continues at the premises while construction work is in progress. It may assist everyone if site rules are applied. Site rules might cover, for example, the use of personal protective equipment, traffic management systems, pedestrian routes, site tidiness, fire prevention, emergency procedures or permit-to-work systems.

Make it clear where your site rules apply and where the client premises rules apply. Make sure everybody knows and follows the rules relevant to them.

To be continued in next issue.

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1. Safety Info
2. Quality Info

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