



Construction fire safety

Construction Information Sheet No 51

Fire can break out on most construction sites. There are around 11 construction fires every day. As you read this publication there is probably a fire on a construction site. Not only can people be killed or injured, but fires can also be financially devastating to those involved.

This publication sets out some basic measures for construction fire safety and is aimed mainly at those managing and working on smaller sites where risks are relatively low (but it should not be assumed that risks are low merely because a site is small). More detailed guidance is also available aimed at higher risk sites and there is much in it that is relevant for any construction site. Its reference is given at the end of this information sheet.

The Construction (Health, Safety and Welfare) Regulations 1996 require measures both to prevent fires happening and to make sure **all** people on construction sites (including visitors) are protected if they do occur. The Construction (Design and Management) Regulations 1994 (CDM) also require those designing, planning and carrying out projects to take construction fire safety into account.

What the law requires in practice will vary depending on the risks. Erecting a simple steel framed building in the middle of a field will only require simple precautions because fire risks are low. Higher risk work such as refurbishing floors in an occupied office block, will need many more precautions because the risk of fire occurring and the difficulties of escaping from it are much greater.

Prevent fire occurring

Most construction fires have simple causes and can be dealt with by simple precautions. The following are particularly important:

- make sure that LPG cylinders and other flammable materials are properly stored. LPG should be stored outside buildings in well-ventilated and secure areas. Flammable materials such as solvents and adhesives should be stored in lockable steel containers;
- LPG supplies should be turned off at the cylinder when not in use. This is particularly important out of hours. Serious explosions have occurred after site huts have gradually filled with gas because an LPG heater has not been turned off. Also make sure site huts are adequately ventilated and do not keep LPG in them if it is not needed;
- make sure that LPG equipment and fittings are properly maintained. Damaged hoses and fittings or makeshift connections are extremely dangerous because they can easily lead to leaks in tough construction conditions;
- if there is any suspicion that LPG is leaking **stop** using it and check. Leaks can be identified by

- hissing, smell or using soapy water, but **never** with a naked flame. Only light up when you are certain that there are no leaks and that any vapour which has leaked has dispersed;
- follow clear rules for hot work such as welding. Formal permit-to-work systems are often appropriate. In particular, make sure extinguishers are at hand and that sparks or heat cannot set fire to surrounding materials. After the work has finished (usually an hour later) check the worksite to make sure that there is no smouldering;
- do not leave tar boilers unattended;
- keep a tidy site and make sure rubbish is cleared away promptly and regularly;
- avoid unnecessary stockpiling of combustible materials, eg polystyrene, and store what is necessary away from ignition sources. Limit what is taken onto site from the store to what is needed for a day's work;
- consider the need for special precautions in areas where flammable atmospheres may develop, such as the use of volatile solvents or adhesives in enclosed areas;
- avoid burning waste materials on site wherever possible. **Never** use petrol or similar accelerants to start or encourage fires;
- make sure everyone abides by site rules on smoking.

Site rules for preventing fire are useless unless they are followed. Employers and construction managers should monitor their worksites and take appropriate action when breaches are found.

Preparing for fire if it happens

Fires can grow extremely rapidly. If a construction fire occurs the primary aim is to ensure that **all** those on site reach safety as soon as possible. Delay can be fatal. Site staff may need to fight a fire to enable their escape, but tackling larger fires is the fire brigade's task.

Raising the alarm

If fire breaks out the alarm should be raised as soon as the first person discovers it.

The type of alarm needed can range from a simple shout of 'fire', to manual bells or klaxons or to sophisticated automatic systems. Whatever system is chosen make sure that it:

- can be heard by **everyone** working on site over normal background noise;
- **will** work when needed (check that existing building alarm systems have not been disconnected if you rely on them during refurbishment work);

- can be activated **immediately** (delay can be fatal).

Means of escape

Construction sites can pose particular problems because the routes in and out may be incomplete and obstructions may be present. Open sites usually offer plentiful means of escape and special arrangements are unlikely to be necessary. In enclosed buildings people can easily become trapped, especially where they are working above or below ground level. In such cases means of escape need careful consideration.

Make sure that:

- wherever possible, there are at least two escape routes in different directions;
- travel distances to safety are reduced to a minimum;
- enclosed escape routes, for example corridors or stairwells, can resist fire and smoke ingress from the surrounding site. Where fire doors are needed for this make sure they are provided and kept closed (self-closing devices should be fitted to doors on enclosed escape routes);
- escape routes and emergency exits are clearly signed;
- escape routes and exits are kept clear. Emergency exits should **never** be locked when people are on the site;
- emergency lighting is installed if necessary to enable escape. This is especially important in enclosed stairways in multi-storey structures which will be in total darkness if the normal lighting fails during a fire;
- an assembly point is identified where everyone can gather and be accounted for.

Fire-fighting equipment

The equipment needed depends on the risk of fire occurring and the likely consequences if it does. It can range from a single extinguisher on small low-risk sites to complex fixed installations on large and high-risk sites. Whatever equipment is needed make sure that:

- fire equipment is located where it is really needed and is easily accessible;
- the location of fire-fighting equipment and how to use it is clearly indicated;
- the right sort of extinguishers are provided for the type of fire that could occur. A combination of water or foam extinguishers for paper and wood fires and CO₂ extinguishers for fires involving electrical equipment is usually appropriate;
- the equipment provided is maintained and works. Fire-fighting equipment should be checked regularly by a competent person - often from the manufacturer;
- those carrying out hot work have appropriate fire extinguishers with them and know how to use them.

Emergency plans

The purpose of emergency plans is to ensure that everyone on site reaches safety if there is a fire. Small and low-risk sites only require very simple plans, but higher risk sites will need more careful and detailed consideration. An emergency plan should:

- be available before work starts;
- be up to date and appropriate for the circumstances concerned;
- make clear who does what during a fire;
- where CDM applies be incorporated in the construction phase health and safety plan;
- work if it is ever needed. On larger high-risk sites fire drills may be appropriate. On smaller sites:
 - you should know what **you** need to do if there is a fire;
 - managers need to make sure that everyone on their sites knows what to do;
 - regular checks should be made to ensure that fire precautions are in place.

Providing information

Fire action notices should be clearly displayed where everyone on site will see them, for example at fire points, site entrances or canteen areas.

References

Fire safety in construction work - Guidance for clients, designers and those managing and carrying out construction work involving significant fire risks
HSG168 HSE Books 1997 ISBN 0 7176 1332 1

Health and safety in construction HSG150 (Second edition) HSE Books 2001 ISBN 0 7176 2106 5

A guide to managing health and safety in construction
HSE Books 1995 ISBN 0 7176 0755 0

HSE priced and free publications are available by mail order from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA Tel: 01787 881165 Fax: 01787 313995 Website: www.hsebooks.co.uk (HSE priced publications are also available from bookshops and free leaflets can be downloaded from HSE's website: www.hse.gov.uk.)

For information about health and safety ring HSE's Infoline Tel: 0845 345 0055 Fax: 02920 859260 e-mail: hseinformationservices@natbrit.com or write to HSE Information Services, Caerphilly Business Park, Caerphilly CF83 3GG.

This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

© Crown copyright This publication may be freely reproduced, except for advertising, endorsement or commercial purposes. First published 11/97. Please acknowledge the source as HSE.