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HSG 168 Fire Safety in Construction: Summary of key changes in the 3rd Edition

Fire safety:
Does your site
comply with
legal duties?



Summary of changes

The third edition of HSG 168 is largely a tidy-up of previous editions, reflecting changes in other allied guidance and regulations. It also acknowledges the emergence of new technologies which are gaining popularity and adding new risks. Whilst the tragedy at Grenfell did not relate to a live construction project, there are some additions to this guidance which appear to be a result of learnings from this disaster.

HSG 168 explains how everyone involved in construction projects can comply with their legal duties relating to fire risks. It is aimed at all those who procure, design, develop and manage construction sites, including clients and designers and it is relevant to all construction projects, including refurbishment.

The main changes to this guidance relate to the elimination, and or, reduction of fire risks at the pre-construction stage as required by the Construction (Design and Management) Regulations 2015. Here are a few observations which may help you as you review the new edition.

**“Duties
relating to
fire risks.”**

→ Pre-construction planning

There is an emphasis on careful pre-construction planning to help reduce the risk of fire during construction, particularly in terms of materials used in construction. The following extracts give a flavour of this reasoning:

- Evaluate the cumulative effect of materials being used or stored or different processes in use. For example, having different trades working on-site with different combustible materials may significantly increase the total amount of combustible material present in the work area (para. 49)
- The points listed in paragraph 98 form the basis of good fire safety management that must start at the design stage. (para. 99)
- Construction work can alter the flammability of materials, including nominally flame-retardant ones. For example, when worked on, solid materials produce dust, crumbs or other fine material which are always more easily ignited than the bulk material. This must be addressed when planning and sequencing works. (para. 204)
- Composite building panels: In the construction phase plan consider eliminating sources of ignition during the removal and installation of composite panels. This includes avoiding methods of cutting panels that create sparks; avoiding methods of fixing that involve flammable solvents, and minimising hot works as a means of drying the surface before the panel is fixed. (para. 360)
- Civil engineering projects: Designers should substitute combustible materials with non-combustible wherever practicable, including for temporary works. (para. 362)

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→ **Lithium-ion batteries, electric chargers and hydrogen**

Lithium-ion batteries are the most common power source for tools on construction sites now, and with this comes the increased need for charging facilities. Hydrogen and electric-powered plant are also in use on-sites now, hence the need for awareness around the fire risks that this equipment poses. Here are some examples of references within the third edition:

- Provide suitable charging points for tools to prevent overloading sockets.
- Modern batteries used in plants and tools, such as lithium-ion batteries may create a significant source of ignition resulting from short circuits, mechanical damage, extremes of temperature, over-charging and fast discharging. Explosive and toxic gases may be released once the damage has occurred. Battery cell explosions may spread a fire via projectiles. (para. 112)
- A site-specific DSEAR risk assessment must be carried out where it is foreseeable that any gases from the delivery, use, storage, or recharging of batteries, or the storage of hydrogen and refuelling of hydrogen plant, could reach explosive levels. (para. 113)
- The use of modern fuel types, such as hydrogen, and battery-powered vehicles and plants, is increasing. Risks associated with the use and storage of batteries, and the refuelling of hydrogen, must be considered during all phases of a project. For example, the use of hydrogen gas or lithium-ion batteries may create explosive atmospheres under the right conditions. Volatile and flammable materials are included in the definition of dangerous substances provided in the DSEAR ACoP L138. (see paragraph 17) Such substances should be substituted at the design stage, where practicable, to reduce sources of available fuel. (para. 145)
- For fires that involve batteries, such as lithium-ion, and hydrogen gas, competent advice should be obtained. (para 314)

**“Battery cell
explosions
may spread
a fire via
projectiles.”**

→ **Complex Sites**

A complex site has been defined in this edition as any of the following:

- High-rise building over 18 m tall (or seven storeys or more). The term ‘storey’ is defined in the relevant Building Regulations
- Large timber-frame development
- Old or historic buildings with hidden voids
- Interconnected buildings
- A large-scale or multi-storey refurbishment project;
- Sites that are partially occupied or will be occupied as part of a phased release
- Use of novel construction methods or materials
- Multiple underground levels; and/or
- Complex fire arrangements in the final design.

In such cases, the guidance is to seek specialist advice since these are considered beyond the scope of HSG 168.

→ **Neighbouring Properties**

Consideration of neighbouring properties is a re-occurring theme in this edition including:

- Identifying hazards on neighbouring properties (for example, whether a neighbouring property has flammable materials stored adjacent to the shared boundary. (para. 34)
- If there are structures outside the site boundary that may be affected by fire, the emergency plan must consider the occupants of the premises outside the construction area itself. (para. 83)
- On timber-frame buildings and engineered wood products: An off-site risk assessment must consider fire spread and the risk to people and property beyond the site boundary and outside of the control of the principal contractor. When a timber-frame extension is being added to an occupied building, the occupied building would be considered offsite. (point 343)

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→ People at Risk

There are situations where people will be at greater risk than normal because of specific circumstances, and some extra points for consideration have been included, for example:

- People wearing personal protective equipment which may affect their ability to hear any alarm or warning. (para. 43)
- People with a health condition or impairment. (para. 43)
- The risk assessment must consider all aspects that can affect the ease of escape, including the type of surface people have to travel over and the work process being carried out. For example, if a surface such as reinforcing bars slows down the speed of travel or if work needs to be made safe before evacuation can commence. It is imperative for every person to escape within a reasonable time. (para. 227)
- The means of raising the alarm needs to take into account people with a health condition or impairment. (Appendix 1 para. 15)

→ Timber-frame buildings

The sections relating to Timber-frame buildings and engineered wood products have been updated, largely mirroring the recommendations made within the Structural Timber Association's 16 steps to fire safety and Design guide during construction to separating distances for timber frame buildings. Again, the focus is on good planning and careful phasing of the construction programme.

Neighbouring buildings are also of prime consideration and a specific 'off-site risk assessment' must consider fire spread beyond the site boundary.

→ Historic Buildings

As well as being listed as a possible 'complex site', historic buildings are recognised as presenting some unique risks which need consideration.

Because of the potential higher risk, you may need extra precautions at certain vulnerable times of the build. The refurbishment of large traditional or historic buildings are potential high-risk projects because they often contain large amounts of dry timber. (para. 339)

“People will be at greater risk than normal.”

→ People to assist with the fire safety management

Titles should as 'fire warden', 'fire marshal' and 'fire safety co-ordinator' do not have universal meaning in terms of their job role, and hence the 3rd edition avoids using these titles and instead focuses on the tasks that need to be carried out as part of the fire safety management. The list of tasks has grown, and is as follows (para. 312):

The following tasks could be part of the defined roles to assist with fire safety management:

- Completing the fire plan/construction phase plan for fire safety
- Undertaking or arranging for fire risk assessments to be completed
- Checking that the site's fire rules are observed, including requirements for smoking, hot works and compartmentation
- Ensuring the GFPs remain adequate, available and in good order
- Arranging for inspections, testing and maintenance of fire safety systems
- Co-ordinating with designers and principal designers
- Co-ordinating with other occupiers on the site and any adjacent premises
- Running fire drills
- Arranging for fire safety training for people with specific roles and workers on-site
- Maintaining a pack of information for use by the fire and rescue service to include site-specific hazards, water access points and routes through the site, etc.
- Issuing hot work permits
- Accounting for people in case of a fire evacuation
- Liaising with the fire and rescue service if there is a fire and providing information on access, people trapped and any special hazards.

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HSG 168 Fire Safety in Construction: Summary of key changes in the 3rd Edition → Liaison with the fire and rescue service There is added emphasis on the information that needs to be made available to the fire and rescue service, both before a project begins and in the case of a fire on-site. Here are some key recommendations: • Consider the risks that firefighters would face on the site, such as asbestos or stored gas cylinders, in the event of a fire or other emergency. Consider how and when to communicate any significant risks to them; either preventively during the planning stages or actively during an incident. Fire mitigation measures must not rely on the fire service attending the site and extinguishing a fire. (para. 44) • Consider whether liaison with the emergency services is necessary to alert them to any significant risks in case of an incident. (para. 89) • The construction of timber-framed buildings creates a heightened risk of a fire spreading beyond the site to neighbouring buildings. STA membership requires members to register the following projects with the National Fire Chiefs’ Council: – where the building floor area (or accumulated floor area for multiple buildings) is over 600 m²; or – which are in high-risk areas (such as areas with high-density in population; adjacent to a petrol station; school; or nursing home); or – which are in areas with known high vandalism rates. (para. 315) • For smaller and low-risk sites, liaison with the fire and rescue service may be disproportionate. However, it is still necessary to consider how the emergency services will have access to relevant information should they get called to the site either during or outside of normal working hours. (para. 317) • Under DSEAR, there is also a requirement to make available to the fire and rescue service information on the dangerous substances present on the premises and the hazards likely to arise from these in the event of an incident, to enable the fire and rescue service to prepare their own procedures to deal with these. On a construction site, it is likely the nature and quantity of any dangerous substances will change as the project progresses. Consideration should be given to determine how the provision of this information to the fire and rescue service is best achieved. (para. 411)	June 2022 “Consider how the emergency services will have access to relevant information.”		HSG 168 Fire Safety in Construction: Summary of key changes in the 3rd Edition	June 2022 For more information on fire safety in construction, call us on 0330 7000 777 or email us today at info@howleruk.com
8			9	

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