

Health and Safety Standard No. 13

Group	Property, Development and Retail Management
Title	Construction fire safety
Date	April 2015

Overview

Fire is an ever-present risk that must be managed throughout the construction phase where the usual building protections have been removed, disabled or have not yet been built. Landsec require compliance with HSE Guidance HSG 168 and the Fire Prevention on Construction Sites – The Joint Code of Practice on the Protection from Fire of Construction Sites and Buildings Undergoing Renovation (JCoP). This health and safety standard signposts key elements from this guidance and also introduces additional Landsec requirements for all construction sites.

Design and planning

Designers have a significant impact on construction fire safety and it is essential that anyone who designs, specifies or influences the program is aware of their responsibilities.

Buildings that are fire engineered can result in a higher fire risk through the construction phase (i.e. Where only one primary exit has been designed and where compartmentation, extract systems and sprinkler systems have not yet been installed and commissioned). It could well be that throughout the construction period the quantity of personnel is much larger than the final scheme design effecting the maximum escape distances and permissible spaces for one exit; it may be necessary to plan and install temporary partitioning and temporary alternative escape routes.

This is why it is essential for a competent fire risk assessor to complete a fire risk assessment in the design phase of the project. This assessment should consider the onsite construction risk and also the impact from and to the neighbouring properties and environment. Adjoining and nearby properties and facilities could pose a heightened risk due to the nature of their business or the facility. Similarly they more be more vulnerable if a fire were to start i.e. their proximity and how the property is used.

This must be provided to the Principal Contractor to develop in further detail when they are tendering and planning the project program.

The fire resistant and retardant properties of building products and internal finishes must be reviewed to allow for informed decisions over the overall fire risk.

Serious consideration should be given to the following:



- Eliminating flammable products or substituting them for less flammable alternatives
- Choosing products and processes that eliminate or reduce on site hot works
- Prefabrication as it reduces cutting, welding, hot works and additional packaging of components on site.
- Sequencing to achieve early installation of escape stairs and fire safety systems, and late installation of delicate finishes that will need protecting.
- Proximity and possible impact of (and on) other occupied buildings

Competency

A practical understanding of how fire spreads and the greater risk on construction sites is paramount for design and construction teams. There must also be acceptance that a number of temporary measures will be required throughout demolition and construction to allow the project to progress safely and protect those working on the scheme.

Landsec requires design and construction team members to be able to evidence their training in the latest guidance, legislation and fire mitigation measures. There are specific training courses available relating to construction fire safety and planning for fire safety mitigation measures (see further guidance).

Landsec requires Designers, Planners, Site Fire Safety Coordinators and Site Fire Marshalls to be trained in their responsibilities.

Principal Contractors who do not have specialism in house, especially for high risk, timber frame and high rise construction projects should ensure they use external accredited construction fire safety specialists to provide this knowledge for them.

Construction

Fire risk assessment and program planning

Each Principal Contractor is required to develop a fire risk assessment and a suitable and sufficient Fire Safety Plan (they should be specific and appropriate to the size of each project).

High risk sites

There are additional requirements for certain developments and these must be understood and adopted by the design and construction team. Developments where there is significant risk to property and people, large projects (over £20 million), high rise (currently approx. over 30m high) and timber frame buildings all fall within this category. Landsec expect the 'high risk' category to be identified on the fire



risk assessment and the additional requirements (as specified in the JCoP and other specific guidance) should be planned into the construction program.

The Fire Risk Assessment must follow the guidance within HSG168 and also identify:

- If the project is a high-risk project (especially high rise and/or timber frame), the specific requirements to control the risk and when these will need to be adopted.
- The location of any temporary accommodation and the fire safety measures to be in place and adopted (such as achieving 30 minutes fire resistance and class 1 flame spread) in line with the JCoP.
- How escape distances will be minimised (and compliant with the maximum escape distances specified in HSG168) and when measures such as external temporary fire escapes and internal partitioning and temporary fire doors will be installed.
- Any location where there is only one means of escape. If the design has one stair core only, an alternative temporary escape route should be provided wherever possible. Where this cannot be achieved additional fire safety measures will be required (i.e. ensuring that escape routes are not through areas of higher fire risk to reach a safe place, eliminating hot works and storage of combustibles from the area)

The Fire Safety Plan must include key elements from HSG168 and the JCoP and also:

- The fire alarm system to be used at each phase of the project (rotary bells are not acceptable as there are other devices such as air horns which allow escape) and the date of planned installation of any sounder system.
- Location of smoking areas and smoking rules for sites including e-cigarettes
- How work on any protected means of escape will be managed

The construction program should be used as a tool to ensure that critical fire safety measures are installed at the earliest opportunity such as installation of fire alarm system, wet risers, fire doors, escape stairs and compartmentation to provide protected escape routes.

Timber frame

The Chief Fire officers Association has previously raised concern about timber frame construction:

“Fires in timber framed buildings have generally resulted in very rapid fire development leading to early structural collapse, and the severity of radiant heat flux generated has caused spread to neighbouring buildings up to 30 metres away. There is further concern that within completed timber frame buildings the risk of fire spread in the event of a fire occurring can increase dramatically should there be any aspects of poor workmanship in areas such as cavity barriers, fire stopping or finish quality. Furthermore, in the longer term, wear and tear as well as professional and DIY alterations will increase the risk of fire spread in completed buildings, even if workmanship on the original construction is good.”



(<http://www.cfoa.org.uk/11064> Sep 2010)

The Structural timber association provide a suite of guidance for timber frame construction which is referenced at the end of this standard and should be followed on all Landsec projects.

All large timber frame buildings must be notified to local fire authorities in line with the Structural Timber Associations Sitesafe notification scheme (link for notification: <http://www.cfoa.org.uk/12248>).

Liaison with operational centres and nearby buildings

The risk to existing adjacent buildings must be reviewed and contact made to allow for joint procedures if appropriate. On remodels, extensions etc. on live trading operational centres or properties the emergency plan must be developed in consultation with Landsec General Managers and the existing premises/store's fire risk assessment. Early liaison with the operational team is essential and must be maintained regularly throughout the project. Joint procedures must be tested to ensure they are effective and adhered to.

Local Fire Brigade Liaison

Liaison with the fire service prior to works starting will be relevant on most Landsec projects especially if any of the following apply:

- A substantial risk to the public, e.g., extensions, remodels where a fire in a large city centre or existing shopping centre may result in the need for large scale evacuation.
- Where there is liaison it is important that the fire service is kept informed of any changes affecting access and firefighting facilities as the works progress. The key contact should be listed within the fire emergency plan on site along with evidence of contact.

A fire brigade grab pack should be produced with current site plans together with adequate signage to identify it at its various locations i.e. at each entrance/exit gate and security hut. The JCoP provides guidance on content of the grab pack.

Audit and review

It is essential that critical points in the program are identified early and there are trigger points in place to prompt a review of fire safety measures. Fire risk assessments must be regularly reviewed to ensure they reflect the current risk. The requirements of the JCoP checklist (referenced at the end of the guidance document) should be used by the responsible person to ensure that all requirements are fulfilled.

Landsec have developed a Construction Fire Safety audit and this or an equivalent must be used at key points in the program to ensure that all the required fire safety measures are in place.



Construction fire safety measures

Security

The risk of arson is real and increases significantly as the project nears completion. Every attempt should be made to assess the risk and identify weak spots in security and access. Fencing and ground floor security should be in place at the earliest opportunity. Installation of CCTV and alarmed scaffolds can also deter intruders.

Temporary accommodation (Any separate cabin, hut, portable building or sections of the building under construction used for welfare, offices, stores and workshops)

Where any temporary accommodation is sited within 6 metres, or constructed inside a building under construction, the requirements of the JCOP must be adhered to. Where automatic fire detection is required (in temporary accommodation) this should be linked to either 24/7 security or a manned offsite security centre.

Demolition

Demolition still requires adherence to the basic fire safety principles for construction sites.

- Fire alarm systems must be installed and the noisy environment and use of other visual or personal vibrating alarms to supplement the main system should be considered.
- Protected stairwells should remain for as long as possible to allow a protected escape route.

Storage areas

Just in time deliveries should be demanded. Planned storage areas must be identified on the fire plan especially where gases and hazardous substances are stored. Storage areas must comply with JCoP guidance.

For storage of all other combustible materials the following hierarchy must be applied:

- Products must be delivered in metal containers or flame-retardant packaging where they will be stored internally. All suppliers and sub-contractors must be notified before orders are placed. Where this is not possible:
- Packaging should be removed immediately after delivery.
- Temporary storage areas should be built and achieve the same standard as temporary accommodation.
- Stored items should be covered with flame retardant protection.
- Combustible packaging and other waste must be removed at the end of each day wherever possible.



Temporary protective coverings and temporary hoardings must conform to LPS 1207 for internal storage. If temporary protection is not marked with its LPCB certificate number, it does not meet the standard. **This requirement also applies to all external sheeting, netting and marketing banners fixed to scaffolding, building facades and other structures.**

Appropriate precautions must be taken to control fire risks to comply with the JCoP and in particular:

- Halogen lights represent a fire risk and therefore will only be allowed when installed at high level in a fixed position by a competent electrician where they cannot come into contact with combustible material.
- Dry risers should be installed early with signage at inlets (and outlets on each floor) once they are commissioned. If and when the height of the building under construction becomes a high-rise building, as defined by the JCoP, wet risers should be provided, fed by duplicate pumps and signed in the same manner as dry risers.

Gas and flammable substances fire safety

HSG168 and the JCoP must be used as a reference to ensure that use of all flammable substances and gases does not pose a fire risk.

Acetylene

Acetylene is banned from Landsec sites unless there is no alternative. If there is no alternative then authorisation must be sought jointly from the Principal Contractor representative and Clive Johnson, Landsec Group Head of Health and Safety via a site-specific Justification Report.

Key points

- A thorough understanding and application of the relevant construction fire safety specific guidance (including the guidance references listed below) by the design and construction team is paramount. Landsec require evidence that designers, planners and construction project managers and emergency coordinators understand their responsibilities and can comply with this standard. Evidence of completed training courses will be requested during construction site audits, and project review meetings.
- The construction program must be used as a tool to plan for fire safety controls as this will avoid key requirements being missed or delayed.
- Principal Contractors must demand that all their contractors and suppliers achieve the standards for storage outlined above and have a process in place to monitor this routinely.



Further reading

- Fire Prevention on Construction Sites Eighth edition – Joint code of Practice on the Protection from Fire of Construction Sites and Building Underground Renovation.
- Fire Safety In Construction HSG168 (2010)
- Landsec One Best Way Standard No 3 rev1 Acetylene

Further information

Further information on the safe handling and storage of compressed gases can be found in Landsec Health & Safety Standard

- <http://www.hse.gov.uk/construction/safetytopics/fire.htm>
- <http://www.london-fire.gov.uk/SafetyAtWork.asp>
- <http://www.thefpa.co.uk/>
- <http://www.structuraltimber.co.uk/information-centre/downloads/health-and-safety/>
- <http://www.salvus-consulting.co.uk/training-courses/new-training/construction-management-training/>

Action to be taken: 22 April 2015

Status: Mandatory

Further help and contacts: If you need any further information or guidance please contact any member of the Health, Safety & Security Team.