Tenth edition
Incorporating Amendment 1

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Fire Prevention on Construction Sites

The Joint Code of Practice on the Protection from Fire of Construction Sites and Buildings Undergoing Renovation

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FPA Fire Protection Association
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RISCAUTHORITY AND FIRE PREVENTION ON CONSTRUCTION SITES

Earlier editions of this *Joint Code of Practice* were published by the Loss Prevention Council and then the Fire Protection Association in collaboration with the Construction Confederation (formerly the Building Employers Confederation).

The publication of this tenth edition, incorporating Amendment 1, has been one of the projects undertaken by RISCAuthority, an insurer-funded research scheme administered by the FPA. RISCAuthority membership comprises the UK's leading insurers who actively support a number of expert working groups developing and promulgating best practice for the protection of property and business from loss due to fire and other risks. The updating of the *Joint Code* was undertaken by the FPA Technical Division and experts from the insurance industry who report to the RISCAuthority Risk Control Steering Group.

Other guidance documents produced by RISCAuthority on risk control are available at *www.thefpa.co.uk*.

The FPA is the UK's national fire safety organisation and further details about our range of products and services are available on our website: *www.thefpa.co.uk*.

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CONTRACTORS LEGAL GROUP (CLG)

The Contractors Legal Group (CLG) is a leading legal and contractual advisory company for contractor trade associations within the construction industry. It is supported by Build UK, the National Federation of Builders (NFB), the Scottish Building Federation (SBF) and the National Access and Scaffolding Confederation (NASC). Its main purpose is to review certain contractual and legal affairs of interest to contractors and to represent their interests within the construction industry.

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The guidance within this document is endorsed by:

- Build UK
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- Construction Insurance Risk Engineers Group (CIREG)
- Institution of Civil Engineers (ICE)
- National Federation of Builders (NFB)
- Royal Institute of British Architects (RIBA)
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Note on drafting: Where this *Joint Code of Practice* uses the word 'must', the procedure to which it applies is compulsory. Where the word 'shall' is used, this indicates a mandatory requirement, except where compliance is impractical, in which case a written risk assessment is required. Where the word 'should' is used, the procedure is recommended best practice.

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NOTES TO THE TENTH EDITION INCORPORATING AMENDMENT 1

The following is a synopsis of the principal alterations to the tenth edition incorporating Amendment 1. The Working Party has also taken the opportunity to incorporate a number of minor textual changes throughout the document.

Cover and introductory pages

Editorial amendments only.

Contents

1. Objective of the Code

No amendments.

2. Compliance with the Code

No amendments.

3. Introduction

No amendments.

4. Definitions used in the Code

4.7 Fire resistance. Amended to reference European classifications and associated standards.

4.13 Large timber frame structure. Updated to clarify scope.

5. Design phase

Amendments have been made to highlight the need for consideration of the impacts on fire loading from insulation products and temporary materials.

6. Construction phase

6.1 Responsibilities. Updated to reflect the need for all those with fire safety responsibilities to be adequately trained and competent for their role.

6.1.2 Fire Marshals. Added requirement for sufficient appointed fire marshals to cover for absences.

6.2 Fire safety plan. Contents list reordered.

7. Liaison with the emergency services

No amendments.

8. Emergency procedures

Minor change to clarify suitability of hand operated fire warning devices.

9. Fire protection

New section added at 9.10 requiring implementation of impairment management arrangements for fire systems.

10. Temporary protective covering materials

10.1 Clarification provided in relation to the classification of boards used as temporary covering materials.

10.2 and 10.3 updated to make direct reference to extant applicable certification schemes.

11. Portable fire extinguishers

11.1 Confirms requirement for both main and subcontractor personnel to be competent.

New section added at 11.8 in relation to portable fire extinguishers brought onto site by sub-contractors.

12. Site security against arson

12.8 – Security personnel. Augmented requirement implementing the requirement for the use of licenced personnel/approved companies and their activities to be undertaken in accordance with BS 7944.

12.9 Video surveillance systems (VSS). Requirements for their use and nature updated. Information in relation to remotely monitored VSS added.

13. Temporary buildings and temporary accommodation

13.3 In circumstances where compartmentation is required between modules in the vertical plane, cavities to achieve Class A2-s1, d0 or better in BS EN 13501-1 (ref 12) for reaction to fire achieve 30 Minute (E) fire resistance to BS EN 13501-2 (ref 23) to tests in BS EN 1366-4 (ref 24).

13.5 Amended to reference European classifications and associated standards.

13.11 Sentence added prohibiting the use of deep fat fryers.

14. Site storage of flammable liquids and LPG

No amendments.

15. Acetylene

Amendment to address change in fire and rescue service operational actions.

16. Hot work

Reference added to available guidance, RC7 – Recommendations for hot work, the hot work training film and hot work site induction toolkit.

New section 16.3 added and subsequent sections renumbered. Includes requirement for competent operatives using appropriate equipment in good condition.

16.5 (previously 16.4). Amended to clarify the period of validity of permits.

16.7 (previously 16.6). Updated to highlight need for provision of extinguishers appropriate to the risk.

16.8 Updated and a new section (16.9) added to address specific requirements in relation to screens and associated protection. Subsequent sections renumbered.

16.9 Added to provide further clarification. Subsequent sections renumbered.

16.15 (previously 16.14). Fully re-written and a new section (16.16) added to extend and supplement the fire watch requirements.

17. Electricity and gas

17.3 Reference added to better identify competencies as described in BS 7671.

18. Waste materials

New section 18.3 introduced. Addresses risks and requirements in relation to waste associated with cladding removal work.

19. Plant and vehicles

No amendments.

20. Electric vehicle charging

A new section has been added to the Code of Practice to address the controls required in relation to the charging of electric vehicles.

21. (formerly 20) Stored materials

No amendments.

22. (formerly 21) Smoking

No amendments.

23. (formerly 22) High rise construction sites

23.5 (formerly 22.5). Minor amendment to confirm fire resistance of temporary firestopping material includes for both integrity and insulation.

23.8 (formerly 22.8). Addresses need for effective fire detection consideration as works progress and minimisation of false fire alarms.

23.9 (formerly 22.9). Amended to draw requirement for installation of wet rising mains into line with those stated in Approved Document B.

24. (formerly 23) Best practice advice for the construction of large timber frame buildings

Section title revised as above.

24.12 (formerly 23.12) Amended to clarify requirement in relation to temporary building construction.

24.17 (formerly 23.17). Amended to reference directly the controls described in section 16.16.

Annex A: Sample hot work permit

Sample Hot Work Permit Checklist added to existing Hot Work Permit.

Annex B: Sample permit to burn waste materials

No amendments.

Reference documents

Updating and renumbering of the references as necessary.

AMENDMENT 1 CHANGES

4. Definitions used in this code

4.10 Highrise construction site. Amended to align focus also on the risks associated with the nature of construction and revise reference to fire and rescue service intervention.

6. Construction phase

6.1 Responsibilities. PAS8672 signposted.

13. Temporary buildings and temporary accommodation

13.3 Amended to remove reference to vertically stacked units.

13.3(a)-(i) Confirmation of the continued suitability of Units that met the requirements of the 9th edition of the Code.

13.3(e) Revised to clarify requirement for compartmentation between modules.

13.3(g) Augmented to clarify suitability of profiled or flat steel sheet.

13.6 New section added in relation to the fire resistance of roof/floor construction in vertically stacked units.

20. Electric vehicle charging

20.1 and 20.2 Updated to clarify the requirement focus on Lithium-ion batteries.

New section 20.3 introduced. Addresses risks associated with Electrical Energy Storage Systems (EESS) and Battery Energy Storage Systems (BESS).

RC11 signposted.

23. High rise construction sites

23.5 and 23.6 amended intervals from 10 to 5 floors.

24. Large timber frame structures

Comment added to highlight that risks and mitigations described are broadly applicable to all timber framed structures.

1 OBJECTIVE OF THE CODE

Every year there are numerous major fires on construction sites and in buildings undergoing refurbishment. All have serious consequences: people are killed and injured; buildings, including those of historic interest, are destroyed. Plant and equipment is damaged, work is held up and completion dates are not met.

The objective of this Code is the prevention of fires on construction sites. The majority of fires can be prevented by designing out risks, taking simple precautions, and by adopting safe working practices. All parties involved must work together to ensure that adequate detection and prevention measures are incorporated during design and contract planning stages; and that the work on site is undertaken to the highest standard of fire safety, thereby affording the maximum level of protection to the building and its occupants.

The Code applies to activities carried out prior to and during the procurement, construction and design process – not the completed structure – and should be read in conjunction with all current legislation and HS(G) 168: *Fire safety in construction*.

The scope of this Code applies to projects with an original contract value of £2.5m or above, and applies equally to smaller value contracts where these are part of a large project. A large project is one with a value of £20m and above. There may be exceptional circumstances, such as in the case of high fire risk sites, where these thresholds are reduced. In cases where the construction contract or the insurance contract does not require this Code to apply, this Code shall serve as 'best practice'. All parties must always check with their insurance providers on each project.

2 COMPLIANCE WITH THE CODE

Compliance with this Code – which applies to construction sites, including those where civil engineering works, demolition, alterations, fitting out, renovations, refurbishment or repair work is being carried out – will minimise the risk of accidental or malicious fires. The Code applies to all parties in the supply chain, including those who specify and design, as well as contractors during the construction phase.

Note: If compliance with this Code forms part of the insurance contract, non-compliance with this Code could possibly result in insurance ceasing to be available or being withdrawn, resulting in a possible breach of a construction contract which requires the provision of such insurance.

3 INTRODUCTION

3.1 Proper planning for fire, safety and health must be an integral part of overall preparation and budgeting for the efficient running of construction projects. Clear procedures and standards must be laid down and adequate resources, in terms of time, materials and money, must be committed to the prevention of fires, accidents and ill-health by all concerned with the project (refs 1-2).

3.2 The fire risk assessments undertaken for the site in compliance with the Regulatory Reform (Fire Safety) Order 2005, or equivalent legislation in Scotland and Northern Ireland (refs 3-7), and other applicable legislation, must address the fire prevention and protection measures that must be observed.

3.3 A risk assessment of any work activities involving dangerous substances must be carried out in compliance with the Dangerous Substance (Explosive Atmospheres) Regulations 2002 (DSEAR) (ref 8) and be recorded. Measures must be provided to eliminate or reduce as far as is reasonably practicable the identified risks from dangerous substances.

3.4 The risk assessments in respect of all construction sites must be reviewed periodically due to the rapidly changing nature of the hazards.

4 DEFINITIONS USED IN THIS CODE

4.1 **Alarm receiving centre:** continuously manned remote centre in which information concerning the state of intruder or fire alarm systems is displayed, recorded and passed to the emergency services.

4.2 **Designers:** those, who as part of a business, prepare or modify designs for a building, product or system relating to construction work (see also 'Principal designers').

4.3 **Contractors:** those who do the actual construction work and can be either an individual or a company (see also 'Principal contractors').

4.4 **Employer/client:** the organisation or person for whom the project is being carried out, or the person named as the employer in the contract and/or Articles of Agreement.

4.5 **Fire alarm system:** any means utilised for giving warning of fire on a site. The most basic system may be no more than a hand-held siren or manually operated gong. Certain sites by their size and nature may require "break glass" call-points which, when broken, electronically operate bells, klaxons or sirens.

4.6 **Fire detection system:** a system comprising components for automatically detecting a fire, initiating an alarm and initiating other action as appropriate.

4.7 **Fire resistance:** the ability of an element of building construction, component or structure to fulfil, for a stated period of time, the performance characteristics classified in BS EN 13501-2: 2016: *Fire classification of construction products and building elements. Classification using data from fire resistance tests, excluding ventilation services*. Commonly used performance characteristics are:

R – Loadbearing capacity: The ability of the element of construction to withstand fire exposure under specified mechanical actions, on one or more faces, for a period of time, without any loss of structural stability.

E – Integrity: The ability of the element of construction that has a separating function to withstand fire exposure on one side only, without the transmission of fire to the unexposed side as a result of the passage of flames or hot gases. They may cause ignition either of the unexposed surface or of any material adjacent to that surface.

I – Thermal insulation: The ability of the element of construction to withstand fire exposure on one side only, without the transmission of fire as a result of significant transfer of heat from the exposed side to the unexposed side. Transmission shall be limited so that neither the unexposed surface nor any material in close proximity to that surface is ignited. The element shall also provide a barrier to heat, sufficient to protect people near to it.

These characteristics may be abbreviated to (R) – Stability, (E) – Integrity and (I) – Insulation, but the use of these terms should not be confused with meanings in the National BS 476 series. European testing for classification to BS EN 13501-2 is specified in that classification standard and vary from National fire resistance tests.

4.8 **Fire risk assessment:** an organized and methodical study of the site, the activities carried on there and the likelihood that a fire could start and harm people in and around the site.

4.9 **High fire risk site:** is used in this Code to encompass the following, the first three of which are separately defined below:

(a) a high-rise construction site;
(b) a large project;
(c) a large timber framed structure; or
(d) projects where risk assessments indicate significant potential loss of life or property.

4.10 **High-rise construction site:** a site where an assessment undertaken by a competent person identifies that the workforce is at risk due to the height of the building under construction and the associated complexity of the means of escape. The risks associated with the nature of construction and project progress should be considered alongside the likely response from the fire and rescue service in terms of timeliness and available appliances.

4.11 **Hot work:** operations requiring the use of open flames, grinding, welding, the local application of heat or generation of sparks.

4.12 **Large projects:** projects where the original contract value is £20m or above.

4.13 **Large timber framed structure:** timber framed structure (including other systems such as glued laminated timber (glulam) and cross laminated timber construction (CLT) of four or more storeys and/or an aggregate floor area of 2500m^2 or more.

4.14 **Principal contractors:** contractors appointed by the client to coordinate the construction phase of a project where it involves more than one contractor.

4.15 **Principal designers:** designers appointed by the client in projects involving more than one contractor. They can be an organisation or an individual with sufficient knowledge, experience and ability to carry out the role.

4.16 **Refurbishment:** alterations, renovation or repair of an existing building or structure.

4.17 **Responsible person:** A specific person identified in the Regulatory Reform (Fire Safety) Order 2005 (for England and Wales) and in the equivalent legislation in Scotland and Northern Ireland.

In the context of a construction site this will be the client, when any part of the site falls under their control, or the principal contractor when the site is under their control.

4.18 **Site fire safety plan:** a standalone document (often embodied in the Construction Phase Plan) detailing how fire safety will be managed on site.

4.19 **Site layout plan:** a plan illustrating emergency and firefighting provisions and other information to be provided to the emergency services.

4.20 **Temporary buildings:** includes prefabricated cabins, site huts, cargo containers, caravans, portable and sectional buildings brought onto site for use as offices, stores, workshops, welfare facilities etc, during the course of the works.

4.21 **Temporary accommodation:** a segregated part of the building under construction or undergoing refurbishment and occupied as offices, stores, workshops, welfare facilities etc, during the course of the works.

5 DESIGN PHASE

5.1 During the design stage issues may arise which can impact on fire risk during construction and use when complete.

Where the project is notifiable to the Health & Safety Executive under Construction (Design and Management) Regulations 2015 (CDM 2015) (ref 9), the client shall require the client-appointed parties (principal designers, designers, principal contractors and contractors), to properly discharge their duties under the terms of the Regulations.

In particular, there is a requirement for these parties to co-operate and co-ordinate their activities at all phases of the contract. In the concept and design phases, appointed parties must co-operate with the designer to identify and eliminate hazards and reduce likely risk from hazards where elimination is not reasonably practicable. In particular, the design must be assessed to ensure that fire risk and potential for damage have been fully considered to keep to a minimum during construction and use.

5.2 Consideration should be given to all potential fire hazards which may be identifiable at the design stage. These may be managed by considering:

(a) the use of non-combustible and non-flammable materials to reduce the fire load. Particular consideration should be given to reducing the risk presented by all combustible insulating materials, in particular those in cladding systems, green roofing/walling (or similar alternative features) and structurally insulated panels. This should also include consideration of temporary materials brought onto site to facilitate work such as non-combustible scaffold boards in place of timber boards in high fire risk areas;

(b) materials and methods that avoid the need for hot work on site;

(c) design details that prevent the passage of smoke and flames up through a building during the construction phase;

(d) design of access routes to enable the contractors to construct buildings in such a manner as to retain safe evacuation routes during the construction phase; and

(e) design for firefighting systems and fire alarm systems to allow for their early use – possibly on a partial use basis and implementation of an impairment management system as soon as new systems are functional (even if not formally handed over) which ensures that where impairment actions are required to facilitate work no more than one zone be disabled at any one time.

5.3 Where a fire engineered approach to the design of the completed building has been employed, consideration should be given to the impact that this might have on the construction phase. Care must be taken that in the incomplete building the travel distances, escape routes, compartmentation and provision of firefighting measures are reviewed regularly and any special precautions are relayed to the construction team.

5.4 Due to the potential consequences of a fire in a large timber structure during the construction process, the proximity of an incomplete structure to the site boundary and to surrounding buildings should be addressed when the fire hazards are considered at the design phase. Specialist assistance may be needed from competent persons familiar with current guidance documents.

6 CONSTRUCTION PHASE

6.1 Responsibilities

During the construction phase the responsibility for health and safety on site passes to the principal contractor (where there is more than one contractor) or to the contractor in the case of a single contractor project.

For notifiable projects, the principal contractor or contractor has duties along with the client to ensure that suitable project-specific management arrangements for health and safety are in place from the start of the work and that these are reviewed/maintained throughout the project. This will include ensuring that a suitable construction phase plan is produced. This construction phase plan should include a fire safety plan within it. The Client shall ensure that the construction phase does not start until the plan is prepared and that suitable arrangements are made for welfare facilities to be present from the start of the work.

Information in relation to the competency requirements for Principal Contractors can be found in PAS 8672 – See 'Further Reading'.

For all projects, a 'responsible person' must be identified at each stage of the project as required by the Regulatory Reform (Fire Safety) Order 2005 (or equivalent legislation in Scotland and Northern Ireland) (refs 3-7). Suitable records should be kept identifying the person responsible in the construction phase plan and the fire risk assessment.

The responsible person is defined (see 4.17) as the person who has control of any part of the premises. In most construction projects this will be the principal contractor. In projects such as refurbishing occupied premises, the client may have control or partial control, and duties and responsibilities need to be clearly agreed before construction work commences.

Where the client only has partial control, they must co-operate with other responsible persons to ensure fire safety measures for the site are coordinated and do not conflict.

All persons charged with fire safety roles and responsibilities must be able to demonstrate current training and competence relevant to their roles and records of such be maintained by the principal contractor and for their sub-contractors, such records must be required and audited.

6.1.1 Responsible person

The responsible person must take such general fire precautions as will ensure, so far as is reasonably practicable, the safety of his employees and, in relation to persons who are not his employees, take such general fire precautions as may reasonably be required in the circumstances.

This will include that:

(a) all procedures, precautionary measures and safety standards as laid down in the site fire safety plan are clearly understood and complied with by all those on the project site(s);
(b) where necessary, a system using hot work permits is established, and compliance monitored;
(c) weekly testing of the fire alarm (and any domestic style smoke detectors) is carried out and that other smoke and heat detectors on site are tested as determined by a risk assessment;
(d) weekly inspections are conducted of escape routes, fire and rescue service access, firefighting facilities, temporary emergency lighting, the routing of temporary electrical cables and work areas. The requirements laid down in the site fire safety plan should also be monitored;
(e) liaison is maintained with the local fire and rescue service and they are invited to undertake site inspections and familiarisation tours;
(f) liaison is maintained with site security personnel where they are employed;
(g) a proper maintenance regime for fire protection equipment is instigated, including the keeping of a written record of all checks, inspections and tests;
(h) a written record of fire safety training of site operatives and of all fire patrols and fire drill procedures is maintained;
(i) the detailed arrangements and actual procedures for calling the fire and rescue service are regularly monitored and checked;
(j) during an alarm, those duties required for the safe evacuation of the site are executed, and all staff and visitors report to the assembly points;
(k) a fire safe working culture is proactively promoted at all times; and
(l) one or more competent persons should be appointed to assist the responsible person in carrying out their duties.

6.1.2 Fire marshals

(a) On high fire risk sites, the principal contractor should appoint a fire marshal and deputy fire marshal(s) who should be permanently based on site to assist in the implementation of the site fire safety plan.

The fire marshal may be the responsible person required by the Regulatory Reform (Fire Safety) Order 2005 or equivalent legislation in Scotland and Northern Ireland (refs 3-7).

The numbers of fire marshals and deputy fire marshals should be determined by a risk assessment and will take into consideration the size and organisation of the project. The assessment should ensure there is an adequate number to cover any known or unforeseen absences such as sickness and annual leave.

(b) Where appropriate, the fire marshal(s) should be full-time, but otherwise preferably combining this duty with other relevant tasks, such as maintenance of fire systems. However, where circumstances dictate a part-time role, it is essential that the fire marshal(s) are afforded sufficient time to execute their fire safety duties. They should be adequately trained so as to be competent in fire safety matters and have sufficient status and authority for the effective execution of their duties and responsibilities.

(c) Liaison with the emergency services is essential (see section 7).

6.2 Fire safety plan

The site fire safety plan must be based on the fire risk assessment, be specific to the site and be reviewed and updated periodically as circumstances change and to reflect the rapidly changing nature of the hazards. As a minimum, it should detail:

(a) the organisation of, and responsibilities for, fire safety and arrangements for recording all fire safety training given to site operatives;
(b) general site precautions, fire detection and alarm systems, temporary emergency lighting, fire extinguishers and fire points;
(c) the need for escape routes inside the building, including corridors and stairwells, to be clearly signed and kept clear of obstructions as far as is reasonably practicable;
(d) instructions given to those on site of the required actions in case of fire;
(e) fire escape and communications (including an effective evacuation plan and procedures for calling the fire and rescue service);
(f) the need for clear access to the site and buildings to be maintained at all times;
(g) fire and rescue service access, facilities and co-ordination;
(h) the location of inverters and associated isolators where photovoltaic panels are being installed;
(i) arrangements for plant and vehicles, including where necessary the charging of electric plant and vehicles;
(j) temporary buildings and temporary accommodation, including location, fire protection, construction and maintenance;
(k) the use of fire retardant coverings;
(l) measures to prevent fire spread from the site (where appropriate);
(m) the materials storage and waste control regime, with particular reference to flammable and highly flammable materials;
(n) the maintenance of temporary electrical installations;
(o) the requirements for a hot work permit regime where hot work cannot be avoided by other means;
(p) the locations of designated safe smoking areas where they are provided in compliance with no smoking legislation; and
(q) security measures to minimise the risk of arson.

7 LIAISON WITH THE EMERGENCY SERVICES

7.1 During the design phase, the principal designer or designer should contact the fire and rescue service to identify requirements for access.

7.2 At the commencement of the construction phase, the principal contractor (where there is more than one contractor) or the contractor should make contact with the fire and rescue service and provide an initial site layout plan. Provisions for water supplies should also be agreed at this time. Thereafter, updated site layout plans should be available on site for fire and rescue service use, detailing the following:

(a) fire and rescue service access, firefighting shafts, fire lifts and temporary hoist facilities;
(b) dedicated emergency escape routes and staircases;
(c) sprinkler installations, including the expected timeline for when each section of sprinkler protection will be operational;
(d) floor loading limitations;
(e) positions of hydrants on or near the site, dry riser inlets and wet risers;
(f) fire points;
(g) temporary buildings and temporary accommodation; and
(h) hazardous items, eg flammable liquids, gas cylinders, gas mains, electrical risers, temporary holes in floor slabs etc.

7.3 Where work on the site may have an impact on traffic movements in the vicinity, liaison should be established with the local police.

7.4 The local fire and rescue service should be invited to visit the site to undertake regular familiarisation tours and review the access, water supplies and firefighting arrangements.

8 EMERGENCY PROCEDURES

8.1 On all sites, a means of giving warning of fire must be established:

(a) certain sites, by their size and nature, may require a temporary hard-wired linked system operated from call-points. On other sites, manually operated sounders may be practical so long as they are clearly audible above background noises in all areas and can be readily identified as being a fire alarm. Handbells, whistles or klaxons (air horns) may considered adequate for very small construction sites;

(b) where manually operated devices are to be used, there should be multiple provisions of these to ensure that they can be accessed at all times;

(c) the provision of manually operated devices inside an enclosed building should be the subject of a specific fire risk assessment as they have the potential to delay the escape of the operator;

(d) for projects using remotely monitored and wireless fire alarm systems, consideration should be given to ensuring that the signalling system remains uninterrupted throughout the duration of the work. Electronic alarms are preferable to manual provisions.

In some instances automatic fire detection may also need to be installed, see paragraphs 13.8, 13.12 and 13.13.

8.2 Written emergency procedures must be displayed in prominent locations and given to all employees on site. The procedures should clearly identify the assembly point in case of a need to evacuate the site (see Figure 1).

8.3 Nominated personnel, e.g. security guards, must be briefed to provide clear access to the site in the event of an emergency.

8.4 In the case of a fire, contractors should determine that all of their personnel on site have been accounted for, and pass this information to site security staff at the earliest opportunity.

8.5 The principal contractor shall ensure that all members of the workforce on the project are aware of the emergency procedures and their duties, via inductions, refresher courses or other suitable processes. Particular care should be taken where people do not understand English.

8.6 The emergency procedures should be tested by carrying out regular fire drills at least every six months, evacuating the building to the assembly point. Observations from fire drills should be recorded in the fire log book, or similar document, and any appropriate changes made to management procedures or provision of sounders etc.

9 FIRE PROTECTION

9.1 The client, designers or principal designer should ensure, so far as reasonably practical, that the project is designed and planned in conjunction with the contractor and their programming of the works to achieve the early installation and operation of:

(a) permanent fire escape stairs, including compartment walls;
(b) fire compartments within the building under construction, including the installation of fire doors and the completion of fire-stopping, with special attention given to lift shafts, stairwells, service ducts and voids which offer a passageway to heat and smoke;
(c) fire-stopping: it is especially important that this is planned and put in place as work on buildings of modular construction progresses;
(d) fire protective materials to structural steelwork;
(e) planned firefighting shafts duly commissioned and maintained;
(f) lightning conductors;
(g) automatic fire detection systems where planned;
(h) automatic sprinkler and other fixed firefighting installations where planned;
(i) automatic fire detection and extinguishing systems, where these are to be installed to protect large or costly items of equipment or plant; and
(j) temporary emergency lighting, which may need to be provided prior to the installation and commissioning of a fixed system.

9.2 Two means of escape must be available from the structure at all times, including from any basement area and roof. Where dead-end situations exist, even on a temporary basis, they should be subject to special attention. The site should be planned and managed such that escape travel distances are appropriate for the level of fire hazard. Throughout the construction phase, escape travel distances should be minimised wherever possible.

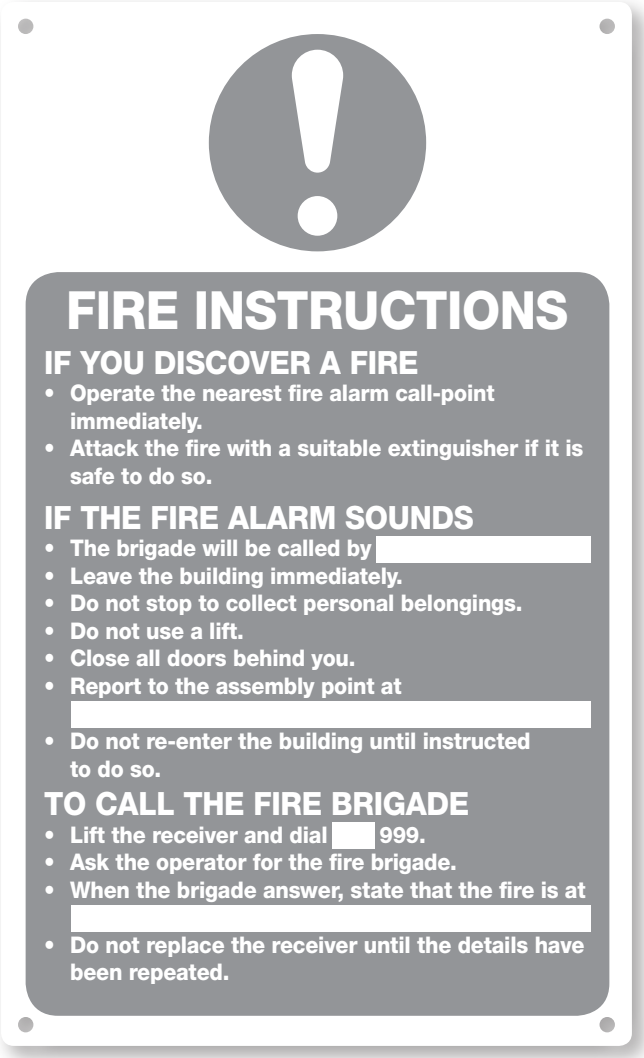

Figure 1: Typical fire action notice

9.3 Adequate water supplies for firefighting should be available as early as possible:

(a) where extension of the fire hydrant main is required as part of the project, then this should be installed as early as possible;
(b) rising and temporary mains must be provided where planned; as the building increases in height it may be necessary to use temporary caps to seal the riser;
(c) it may be necessary to move the fire service inlet point as work progresses;
(d) water supplies should be tested periodically.

9.4 In the case of high fire risk sites, following the agreement for water supplies with the fire and rescue service (see 7.2), on-site water flow should be tested and recorded before work commences and thereafter every three months, at which time all valves should be exercised.

9.5 All hydrants must be clear of obstruction and be suitably marked.

9.6 To protect distribution panels and items of electrical equipment, appropriate extinguishers (such as those containing carbon dioxide) must be provided close to the equipment concerned.

9.7 Clear signs must be installed and maintained in prominent positions indicating the locations of fire and rescue service access routes, escape routes, positions of dry riser inlets, fire extinguishers and manually operated devices used to raise a fire alarm (such as fixed call-points and hand-held klaxons). Signs should be reviewed regularly and replaced or repositioned as necessary (ref 10).

9.8 At the end of each working day or shift, a fire check must be undertaken, particularly in areas where hot work has been undertaken. Where 24-hour security is provided, fire checks should be undertaken throughout the night, during holiday periods and at weekends.

9.9 Permanent occupancy of any part of a building site should not be permitted until all fire protection measures (especially all fire-stopping in relevant compartment walls and ceilings) and installations are complete and, where appropriate, have been commissioned. The insurers, local authority building control department and fire and rescue service must be informed where occupancy is planned.

9.10 Fire systems, including those installed to ensure the safety of occupants during the construction phase, (such as fire detection and alarm systems, sprinkler systems, emergency lighting and suchlike) should be subject to an impairment management and notification system. With respect to sprinkler and fire detection and alarm systems in particular it should be ensured that where impairment actions are required to facilitate work, no more than one zone be disabled at any one time.

The impairment management arrangements should be supported by a suitable risk assessment undertaken by a competent person and seek as a minimum to:

(a) ensure effective supervision and the safe shutdown of the system(s);

(b) ensure that there is effective control of potential fire hazards during impairment;

(c) minimise the duration of the impairment by reinstating the protection system as soon as practicable and tested to ensure they are operational.

Detailed guidance on the temporary impairment of sprinkler systems is described in BS EN 12845 Annex J (ref 11).

10 TEMPORARY PROTECTIVE COVERING MATERIALS

10.1 Finished surfaces, fittings or expensive items of plant and machinery incorporated into a building should be temporarily protected during construction or refurbishment. When selecting a temporary protective covering material, regard must always be paid to the relative fire load and the potential for fire growth and spread. Hard boards used as temporary covering materials must meet Class A2-s1, d0 or better as classified under BS EN 13501-1 (ref 12).

10.2 Where flexible protective covering materials are used, these must conform to the requirements of the LPCB's Loss Prevention Standard LPS 1207: *Requirements for the LPCB approval and listing for fire performance of temporary protective covering materials for use in the interior of buildings* (ref 13) or Warringtonfire Certifire Technical Schedule 63, *Reaction to fire performance requirements: materials used as temporary protective covering* (ref 14). The materials shall be manufactured in accordance with a quality assurance and certification programme, and the protective covering material shall be approved by a third-party certification body accredited by the United Kingdom Accreditation Service. The relevant approval mark shall be printed on the material.

10.3 When flexible materials are used to clad scaffolding, these materials must conform to the requirements of LPS 1215: *Requirements for the LPCB approval and listing for fire performance of containment net and sheet materials for external use on construction sites* (ref 15) or Warringtonfire Certifire Technical Schedule 62, *Reaction to fire performance requirements: materials used to clad scaffolding* (ref 16). The material shall be manufactured in accordance with a quality assurance and certification programme, and the scaffolding covering material shall be approved by a third-party certification body accredited by the United Kingdom Accreditation Service. The relevant approval mark shall be printed on the material.

10.4 It is recognised that overprinting of materials with advertising or images does occur. In such instances it must be ensured that this does not detrimentally affect their fire performance. Confirmation of this should be sought through testing of the printed material by the certification body.

10.5 Third party approved temporary flexible protective covering materials must be exclusively used on all parts of the project, including scaffold cladding, containment nets, temporary roof sheeting and other tarpaulins. It is not acceptable to use non-approved materials in different parts of the building, at different storeys/heights or on different elevations of the building.

10.6 Flame retardant protective covering material can still burn; therefore at least one fire escape stairway should be kept free of all protective coverings.

11 PORTABLE FIRE EXTINGUISHERS

11.1 Personnel must be sufficiently competent to be able to use the portable firefighting equipment provided on site. This includes both main and sub-contractor personnel.

11.2 An adequate number of appropriate portable fire extinguishers, approved and certificated by an independent, third-party certification body, should be provided, in accordance with the requirements of BS 5306-8: *Fire extinguishing installations and equipment on premises: Selection and installation of portable fire extinguishers: Code of Practice* (ref 17). However, in the case of high fire risk sites, the fire risk assessment may indicate that additional portable fire extinguishers should be provided, especially on escape routes.

11.3 Extinguishers must be located in conspicuous positions near exits on each floor. In the open they should be situated in red boxes raised 500mm above ground level with a sign 'FIRE POINT' at a height readily seen above intervening huts or storage.

11.4 All firefighting equipment which is not designed to come into use automatically must be easily accessible.

11.5 All portable firefighting equipment must be serviced annually in accordance with BS 5306-3: *Fire extinguishing installations and equipment on premises: Code of Practice for the inspection and maintenance of portable extinguishers* (ref 18) by a qualified person, and the maintenance service date recorded, including marking on the appliances.

11.6 As work progresses, the adequacy of portable firefighting equipment must be reviewed as part of the fire risk assessment reviews.

11.7 'Ride-on' mechanically propelled site plant should carry an appropriate fire extinguisher where reasonably practicable.

11.8 Portable fire extinguishers brought onto site by sub-contractors (such as to support hot work operations) must be registered with and clearly labelled for use by the principal contractor. Such extinguishers should similarly meet the requirements of sections 11.2 – 11.5 inclusive.

12 SITE SECURITY AGAINST ARSON

Arson protection is a feature of the site fire safety plan and should be the subject of a suitable and sufficient risk assessment. In certain cases, such as on high fire risk sites, a separate risk assessment should be undertaken to specifically consider the implications of wilful fire raising.

12.1 Buildings must be suitably protected against theft, malicious damage and deliberate fire raising in accordance with findings of the fire risk assessment.

12.2 The most effective method of deterring trespassers – as well as helping to prevent malicious fire – is to ensure as far as reasonably practicable that the site is secured against unauthorised entry. This may be achieved by erecting a suitable and sufficient hoarding around the perimeter of the site, and securing all access points such as windows and doors on refurbishment sites. The site entrance must be locked and secured outside normal working hours.

12.3 Where the completed project provides for permanent security fencing, this should be brought forward in the programme and utilised during the construction phase.

12.4 Pedestrian access points and vehicle gates should be secured with high security close or concealed shackle padlocks and chains of a commensurate quality. A secure perimeter also provides protection against injury claims from trespassers.

12.5 Where the building envelope forms the site perimeter, all accessible openings such as ground floor windows and doors and vulnerable higher level windows should be secured against unauthorised entry. This may be achieved through the early installation of doors and windows or temporarily boarding such apertures with 18mm plywood or proprietary steel shuttering. Doors and windows should be fitted with locks, and secured when the building is vacant. Access to upper levels via scaffolding should be prevented.

12.6 Flammable liquid stores, liquefied petroleum gas cylinder storage and combustible material stores must be fenced or otherwise suitably protected and signed on the outside of the perimeter barrier (see section 14).

12.7 Illumination of the site is an additional deterrent to unauthorised access, and is recommended.

12.8 The recruitment of security personnel should be considered on all sites, especially for employment on site outside normal working hours. Security guards should be licensed by the Security Industry Authority (SIA) and work for a company approved under the Approved Contractor Scheme (ACS) or alternatively work for a company with NSI Guarding approval or an SSAIB Registered Static Site Guarding and Mobile Patrol Services company. In addition, they should work in accordance with the relevant Code of Practices i.e. BS 7499: *Provision of static guarding security services. Code of practice* (ref 19) and BS 7858: *Screening of individuals working in a secure environment. Code of practice* (ref 20). Appropriate formal Assignment Instructions should be provided to include guarding duties in terms of site security and safety checks and emergency response procedures including relevant emergency contact details. The number of security staff and arrangements for touring, inspecting, and record keeping should be subject to a risk assessment.

12.9 On high fire risk sites, the use of detector activated remotely monitored video surveillance systems (VSS) and/or a permanent security presence should be considered and implemented where appropriate or as otherwise recommended as a result of a specific security risk assessment. Preference should be given to the use of BS 8418 (ref 21) compliant VSS wherever practicable, or an insurer agreed alternative.

Where the use of remotely monitored VSS is considered, features should include: audio challenge capabilities; cameras able to provide images in all lighting conditions; anti-tamper mechanisms such as physical protections, anti-masking and anti-shock; and system failure alerts such as camera failure, loss of signalling or power failure. There should also be a 'Response Plan' or 'Service Agreement' with the VSS operator outlining the actions that are required after any activation, fault or tamper signal.

12.10 All personnel should be on the alert for fires started maliciously by on-site staff.

12.11 In the event of suspension of site works, the security and fire risk assessments should be reviewed and the precautions taken also agreed with the security provider. Further advice and guidance is set out in the *Code of practice for the protection of empty buildings: fire safety and security* (ref 22).

12.12 Consideration should be given to the installation of intruder alarm systems in temporary buildings and temporary accommodation.

13 TEMPORARY BUILDINGS AND TEMPORARY ACCOMMODATION

Temporary buildings and temporary accommodation are defined in section 4.20 and 4.21.

13.1 The site fire safety plan must include a suitable and sufficient fire risk assessment for all temporary buildings and temporary accommodation. The assessment should be reviewed periodically.

13.2 Temporary building(s) should be separated from the building under construction or refurbishment and other permanent buildings to provide as wide a fire break as reasonably practicable. While it should be aimed to provide a fire break at least 10m wide, it is recognised that this is not always possible, but wherever practicable the fire break should be at least 6m wide. Fire breaks should be kept clear of combustible materials. Similarly, rows of temporary buildings should be separated to provide a reasonable fire break with the intervening space being kept clear of combustible materials.

13.3 Temporary buildings which meet the criteria described in the 9th Edition of the Joint Code (clause 13.3) and are properly maintained will continue to be acceptable for use. The following revised and updated requirements are provided to assist with future product development and offer a direction of travel. It is anticipated that as of the 1st January 2025 modules meeting these revised requirements will be available to contractors and revisions to this Joint Code implemented at that time.

Where it is not reasonably practicable to provide a fire break as described in 13.2 at least 6m wide, temporary buildings must be constructed with materials that do not significantly contribute to the growth of a fire or the propagation of smoke and corrosive or toxic fumes. The temporary building should be designed and constructed so as to meet the following criteria:

(a) Temporary buildings shall not have a storey above 18m above ground, including those elevated above the site or highway;

(b) Compartment floors comprising tops and bases of modules shall achieve 30 Minute (REI) fire resistance to BS EN 13501-2 (ref 23);

(c) Compartment walls to achieve 30 Minute (REI) fire resistance where loadbearing or 30 Minute (EI) fire resistance where non-loadbearing infill to structure that achieves 30 Minute (R) fire resistance to BS EN 13501-2 (ref 23), including around escape stairs;

(d) External walls and roof to achieve 30 Minute (REI) fire resistance where loadbearing or 30 Minute (EI) fire resistance where non-loadbearing infill to structure that achieves 30 Minute (R) fire resistance to BS EN 13501-2 (ref 23), with the roof to be tested from below;

(e) In circumstances where compartmentation is required between modules in the vertical plane, cavities to achieve Class A2-s1, d0 or better in BS EN 13501-1 (ref 12) for reaction to fire and be fire stopped to achieve 30 Minute (E) fire resistance to BS EN 13501-2 (ref 23) to tests in BS EN 1366-4 (ref 24).;

(f) All doors, windows and ventilators to achieve 30 Minute (E) fire resistance to BS EN 13501-2 (ref 23) and be securely closed when the area is unoccupied. Fire resisting doors, windows and ventilators must be fitted with automatic self-closing devices;

(g) External surfaces of walls including any attachments such as walkways to achieve Class B-s3, d2 or better in BS EN 13501-1 (ref 12) for reaction to fire; (profiled or flat steel sheet at least 0.5 mm thick with an organic coating of no more than 0.2mm thickness is also acceptable);

(h) External surface of roof to Class B_{ROOF}(t4) to BS EN 13501-5 (ref 25); and

(i) Internal floor, wall and ceiling surfaces to Class C-s3, d2 or better in BS EN 13501-1 (ref 12), including within cavities below raised floors to the base of modules, behind linings, or above suspended ceilings to the soffit of modules.

Insulation materials that are part of the external wall or roof construction should be of limited combustibility or better (A2-s1, d0 or Class A1) in BS 13501-1 (ref 12).

Further information with regard to the reaction to fire classification and transposition to national classes is provided in Table B1 in *Approved Document B, Volume 2* (ref 26).

13.4 Where the floor of a temporary building is raised above ground level, the space beneath must be enclosed to prevent accumulation of rubbish, whilst still allowing under-floor ventilation. No combustible materials should be stored under any temporary building.

13.5 Temporary accommodation must be constructed with materials which do not significantly contribute to the growth of a fire or the propagation of smoke and/or corrosive fumes. It must also meet the following criteria:

(a) it must be separated from the rest of the building by external walls and ceilings which achieve 30 Minute (REI) fire resistance where loadbearing or 30 Minute (EI) fire resistance where non-loadbearing infill to structure that achieves 30 Minute (R) fire resistance to BS EN 13501-2 (ref 23), with the ceiling to be tested from below;

(b) All doors, windows and ventilators to achieve 30 Minute (E) fire resistance to BS EN 13501-2 (ref 23) and be securely closed when the area is unoccupied. Fire resisting doors, windows and ventilators must be fitted with automatic self-closing devices; and

(c) Internal floor, wall and ceiling surfaces to Class C-s3, d2 or better in BS EN 13501-1 (ref 12), including within cavities below raised floors to the base of modules, behind linings, or above suspended ceilings to the soffit of modules.

Insulation materials that are part of the external wall or roof construction should be of limited combustibility or better (A2-s1, d0 or Class A1) in BS EN 13501-1 (ref 12).

Further information with regard to the reaction to fire classification and transposition to national classes is provided in Table B1 in *Approved Document B, Volume 2* (ref 26).

13.6 In circumstances where temporary buildings are stacked vertically the floor/roof assembly and any supporting members to achieve 30 minutes (REI) fire resistance to BS EN 13501-2 (ref 23) or British national equivalent test(s).

13.7 Wherever possible, fire exits from temporary buildings and temporary accommodation should lead directly to the open air, away from the structure on which work is being undertaken and to a place of ultimate safety. Escape routes should be subject to periodic inspection and assessment. Where necessary, temporary protection to provide at least 30 minutes' fire resistance should be provided to ensure the safe passage of personnel to a place of safety away from the site.

13.8 It may be necessary to erect or install temporary buildings and temporary accommodation within the building under construction or refurbishment. This must be prohibited in large timber framed structures. In other instances:

(a) temporary buildings and temporary accommodation must meet the fire performance characteristics stated in sections 13.3 and 13.5 respectively; and

(b) temporary buildings and temporary accommodation should be erected in locations which provide ease of access for the fire and rescue service and easy evacuation for personnel. In this respect locating temporary buildings and temporary accommodation within basements or on upper floors, ie at a height in excess of 7.5m from site access level, should be avoided where possible. Where this is not practical, other suitable precautionary measures must be adopted following the fire risk assessment and after consultation with the appropriate authorities. These measures must be maintained during the course of construction and until a time when the temporary buildings and temporary accommodation can be relocated within the lower floors.

13.9 Temporary buildings or temporary accommodation located:

(a) inside the building under construction/refurbishment;

(b) inside another permanent building; or

(c) within 10m of such building(s).

must be fitted with fire detection systems complying with a recognised Category of installation as set out in BS 5839-1: *Fire detection and alarm systems for buildings: Code of practice for system design, installation, commissioning and maintenance* (ref 27). In the case of high fire

risk sites, the fire detection system must be linked to the fire alarm system in the building on which work is being undertaken and to an alarm receiving centre, unless there is a 24-hour site security presence on site.

Components of automatic fire detection and alarm systems utilised within Temporary Buildings and Temporary Accommodation should ideally be marked as complying with EN 54 (ref 28) where such can be shown to be appropriate for the circumstances by a competent contractor.

13.10 Heaters for use in temporary buildings and temporary accommodation must be fixed, preferably above floor level, fitted with securely fixed metal guards and maintained in a sound condition.

13.11 Carelessly drying clothes causes fires. Coat stands and drying racks must be firmly positioned at a safe distance from heaters, which should be thermostatically controlled and have enclosed elements.

13.12 All heaters and cooking appliances must be properly installed and adequate ventilation provided. Where possible, microwave ovens should be used to cook or heat food – otherwise, electrical or gas cookers are preferable to gas rings for cooking. The use of deep fat fryers of any size or style must be strictly prohibited.

13.13 The installation of suitable automatic fire detection systems and intruder alarms is strongly encouraged in all temporary buildings and temporary accommodation. Intruder alarm systems should be installed in accordance with the SSAIB *Code of Practice for temporary alarm systems* (ref 29).

13.14 Automatic fire detection systems must be installed where flammable liquids and gases are stored and in temporary buildings and temporary accommodation used for cooking or the drying of clothes. Installations should comply with a recognised category of system as set out in BS 5839-1 (ref 27).

13.15 Temporary building(s) should not contain more than the minimum of furniture and fittings of a combustible nature.

13.16 Open plan areas created by linking prefabricated units of temporary buildings and areas of temporary accommodation used for multiple purposes should be sub-divided by fire-resisting construction to provide at least 30 minutes' fire resistance where deemed necessary by the fire risk assessment of the area.

13.17 Caravans, mobile homes and similar purpose-built sleeping accommodation should be separated from the structure under construction or refurbishment, as set out in section 13.2, and be enclosed by a palisade, fence or hoarding such that there is no interconnecting route between the two areas.

13.18 On new build sites, construction workers must not occupy living accommodation within a structure on which work is being undertaken (see also 9.9).

14 SITE STORAGE OF FLAMMABLE LIQUIDS AND LPG

14.1 Flammable liquids and gases used and stored on site must be subject to a periodic assessment in compliance with the Dangerous Substances and Explosive Atmospheres Regulations 2002 (ref 8).

14.2 Containers of flammable liquids and LPG cylinders should preferably be stored in open compounds which are securely fenced, shaded from the sun and remote from pits, drains and low lying areas. Stores of liquid fuels must be surrounded by an imperforate bund sufficient to contain the maximum contents of the largest drum stored, plus 10 percent. The bund must not be allowed to accumulate water or waste material. Flammable liquids and LPG must not be stored together.

14.3 Where it is necessary to store flammable liquids and gases in circumstances other than as in paragraph 14.2, the quantity stored must be the minimum necessary and no more than a day's supply. The containers must be kept in a store, cupboard or bin which is of fire-resistant construction.

14.4 Storage areas should be sited as far as reasonably practical from permanent and temporary buildings and at a minimum of 20m wherever possible in the case of high fire risk sites. Where practical, given the constraints of the site, containers and drums of flammable liquid or gas cylinders must not be stored within 10m of any building or boundary fence (and in no circumstance closer than 4m) unless the boundary is a wall at least 2m high and constructed to provide a minimum of 30-minutes' fire resistance. In the latter case, containers and drums should be at least 1m below the top of the wall.

14.5 Products which could add to the intensity of a fire, such as acetylene or oxygen, or to the toxic hazard in the event of fire, such as chlorine, must not be stored in the same compound as flammable liquids and LPG.

14.6 Appropriately worded warning signs, eg 'HIGHLY FLAMMABLE LIQUIDS', 'NO SMOKING' and 'NO NAKED LIGHTS' must be displayed prominently at the entrances to stores.

14.7 The floors of flammable liquid or LPG cylinder stores should be paved or compacted level, with a suitable hard-standing provided for the delivery and dispatch of cylinders. The area must be kept clear of all combustible materials, weeds and rubbish.

14.8 Any electrical fittings, eg lights and switches, within such stores must be suitable for the environment in which they are to be used (ie where a flammable or explosive atmosphere may be present) and be selected and installed by competent persons (ref 30).

14.9 The provision of automatic flammable gas detection equipment should be considered for enclosed storage locations.

14.10 Adequate numbers of extinguishers appropriate to the hazard should be sited at entrances to storage areas.

14.11 There should, where possible, be designated areas for fuelling plant and vehicles. The use of petrol generators in high risk structures should be avoided.

15 ACETYLENE

Acetylene is a flammable gas that, at elevated temperatures and pressures, can become unstable and liable to spontaneous decomposition. As a result, acetylene in cylinders, once suspected to be unstable, constitutes a serious fire and explosion hazard.

In these circumstances, fire service safe working practices include the establishment of a hazard zone of up to 200m around the incident depending on the topography of the surrounding land and the degree of protection provided by nearby buildings and structures and leaving the cylinders involved undisturbed for considerable periods of time while consecutive 1 hour cooling and monitoring activities are undertaken prior to removal. All activities in the designated hazard zone have to cease and the area is evacuated, with significant implications for the businesses operating in the area.

15.1 The use of acetylene on construction sites should be eliminated wherever reasonably practicable and alternative methods of cutting and welding be adopted (ref 31).

15.2 Where the use of acetylene is unavoidable, the number of spare cylinders stored on site should be kept to the absolute minimum.

15.3 Acetylene cylinders should be removed from the workplace and returned to the storage area as soon as the period of work has been completed.

15.4 Acetylene cylinders should be removed from the site as soon as their use is complete.

16 HOT WORK

See also 24.17 regarding hot work on the sites of large timber frame structures. Further advice and guidance in relation to safety when undertaking hot work activities can be found in RC7 *Recommendations for Hot Work* (ref 32). Additional free resources including a hot work training film (ref 33) and hot works site induction toolkit (ref 34) are available to download from the RISCAuthority website – www.riscauthority.co.uk).

16.1 Alternative methods to hot work (ref 32) should be adopted where possible.

16.2 When there is no alternative to hot work then, if possible, the hot work should be undertaken in a dedicated area away from the area of work or storage of materials.

16.3 All hot work procedures should only be carried out by trained personnel, using equipment which is in good condition and being used in accordance with the manufacturer's instructions. Frequent training should be provided to all relevant personnel to make them aware of the risks associated with hot work.

16.4 All hot work must be subject to a hot work permit (a sample permit is shown in Annex A);

(a) once fitting out work has commenced on site; and
(b) in all buildings which are being refurbished.

16.5 Hot work permits must only cover specific, identified activities and locations and be signed off at the end of each work period. Similarly permits should not be issued for protracted periods. Fresh permits should be issued where, for example, work extends from morning to afternoon. 'Blanket' permits covering hot work activities over an extended period or several days must not be allowed. To identify and rectify any non-compliance issues, completed permits shall be inspected by a senior member of the project staff on a regular basis (maximum monthly). These inspections should be recorded.

16.6 Before starting hot work, the area must be cleared of all loose combustible material and, if work is to take place on one side of a wall or partition, the opposite side must be examined to ensure no combustible material will be ignited by conducted heat.

16.7 At least two fire extinguishers must be at hand and a careful watch maintained for fire breaking out whilst work is in progress. The types and size of extinguishers provided should be appropriate to the risks at hand, nature of the work being undertaken, equipment used and the local environment. Provision should include as a minimum at least one water based or foam unit with a minimum 13A rating. Those undertaking the hot work activity, including the fire watch, should be trained and competent in their use.

16.8 When welding, cutting or grinding, the work area shall be suitably screened using a non-combustible material such as welding protection screens meeting the requirements of BS EN ISO 25980 (ref 35) or welding blankets wherever practicable. Subject to a written suitable and sufficient risk assessment undertaken by a competent person, temporary protective covering materials as described in Section 10 may be used in circumstances where the use of non-combustible materials is not practicable.

16.9 Where exposures from hot sparks, splatter etc are present the risk assessment on the type of protective screen used must consider the following risk control objectives:

- reducing the risk of the protection covers igniting
- provide shielding to prevent sparks or molten splatter passing through the screens and igniting combustible materials and/or injury to people outside the hot work area

Where shielding is a risk control objective, the specification criteria of the protective cover shall include maximum heat resistance temperature (comparable with type of hot work) and design to provide the necessary shielding from splatter or sparks. Temporary protective covering materials as described in Section 10 are not designed or tested as welding screens and have very limited shielding resistance to sparks or molten metal globules which can melt the sheeting and pass through.

16.10 Equipment and hoses used with oxy-acetylene and similar equipment should be in good condition, set up in accordance with the manufacturer's instructions and be subject to a visual inspection before each period of use. A flashback arrestor should be fitted.

16.11 Gas cylinders must be adequately supported in a vertical position, preferably by securing on purpose-built trolleys using straps or chains. Cylinders should be fitted with a regulator that is not more than five years old.

16.12 Welding and cutting procedures should only be carried out under the supervision of trained and competent personnel.

16.13 Tar boilers and similar equipment should be placed at ground level wherever possible. A boiler may be placed in another location convenient for the works only if a risk assessment shows that overall it is a greater hazard to have the boiler at ground level.

16.14 The following precautions should be applied when using tar boilers:

(a) a non-combustible heat-insulating base must be provided;
(b) the equipment must be supervised by an experienced operative who can monitor the bitumen level and temperature, and ensure the lid remains on the boiler;
(c) the boiler should be sited where spilled material can easily be controlled;
(d) all cylinders must be at least 3m from the burner, secured in a vertical position and connected by flexible armoured hose;
(e) at least two appropriate fire extinguishers must be to hand;
(f) hazardous materials must be removed from the location as soon as work is completed and before the hot work permit is signed off;
(g) a lit tar boiler should not be left unattended; and
(h) a tar boiler should not be moved when lit.

16.15 Any area specified in a hot work permit must be subject to a continuous fire watch:

(a) The fire watch should be maintained during the period of works by a dedicated individual or individuals where a suitable and sufficient risk assessment indicates the potential for hot work impacts to be more widespread (for example, if the work area is particularly large, multi-level and/or congested; or an opening or thermally conductive assembly extends through a wall). The continuous fire watch should be maintained for at least one hour after work is completed.

(b) Additional checks must be made at regular intervals for a further one hour but may be needed for longer based on a risk assessment. In some cases, completing these checks for up to three hours, or more, might be appropriate after cessation of hot work before the permit is signed off. These further checks should be at intervals of no more than 20 minutes and must include any area(s) on the other side of any wall, partition or ceiling within 10 metres of the area, and/or floors below, in which the hot work has been carried out. In circumstances where such areas fall beyond those to which the contractor has control, liaison with the main contractor should be established to support or enable this activity. The fire watch periods should be extended where determined necessary by a suitable and sufficient fire risk assessment.

(c) Ideally photographs of the immediate vicinity, adjacent voids and vulnerable spaces should be taken to demonstrate that a fire watch has been undertaken. In all circumstances the fire watch must be maintained during lunch or tea breaks or any other temporary cessations of work. Photographs should be appended to the hot work permit and available for review as part of the sign off process.

(d) Thermographic cameras should be used routinely, before the work is undertaken, during and after the work as part of the fire watch. Their use allows the fire watcher to compare images and ensure the thermographic signatures match pre and post-work, hence checking the area for any potential hot spots. Photographs should be held on record.

16.16 As described in 16.15 the minimum fire watch periods should be extended in circumstances where a suitable a sufficient fire risk assessment undertaken by a competent person has deemed it necessary. Such circumstances include, for example, where hot work has been undertaken within or adjacent to a timber framed structure; high rise construction sites; where the presence of holes or voids may allow smouldering to occur unseen; where wall or floor openings within a 10m radius expose combustible materials in adjacent areas (which may include concealed spaces in wall or floor construction); where work is undertaken in locations where there is restricted access or visibility.

17 ELECTRICITY AND GAS

17.1 Electrical supply installations, both temporary and permanent, must be installed in accordance with the latest edition of BS 7671: *Requirements for electrical installations* (ref 36) and the Electricity at Work Regulations 1989 (ref 37).

17.2 Portable electric equipment used on site should carry durable labels which display that it has been inspected and tested and is in satisfactory condition. (Guidance on the frequency and scope of the inspection of portable electrical equipment is available from the HSE (ref 38).)

17.3 All electrical work should be undertaken by a skilled (electrically) or instructed (electrically) person as defined in BS 7671: *Requirements for electrical installations* (ref 36).

17.4 Installations (especially of a temporary nature) must be inspected regularly and tested at intervals not greater than every three months, or when they have been altered. The results must be recorded in a register kept for the purpose.

17.5 Electric cabling (especially of a temporary nature) should be protected against damage from construction site activities in its vicinity.

17.6 Temporary lighting:

(a) Where portable or temporary lights are required, these should be located well away from combustible materials.
(b) Where low voltage festoon lighting cannot be used, sealed fluorescent light tubes are recommended.
(c) The use of unprotected quartz halogen lights should be avoided.

17.7 Where possible, main switches – other than those controlling fire protection, security and life safety systems – should be turned off when work ceases, and all equipment unplugged when not in use.

17.8 Photovoltaic panels should be installed in accordance with the specification or relevant Code of Practice under the contract.

17.9 Where photovoltaic panels are being installed, signs must be displayed in accordance with the specification or relevant Code of Practice under the contract at the earliest opportunity to warn site staff and firefighters of the presence of live DC power supplies and the location of the isolators.

17.10 Following their installation, photovoltaic panels should be isolated and not be used to produce power for site use during the construction phase.

17.11 All permanent gas supplies must be installed by a registered gas installer. The contractor must check that those carrying out the work are so registered.

17.12 Gas supply to appliances should be by fixed piping or armoured flexible tubing. Gas cylinders should be located outside buildings, secured and protected from unauthorised interference. Gas appliances should be fitted with control taps. (If the only control is on a cylinder situated outside a building, there can be a dangerous build-up of gas during the time-lapse between turning on and ignition.)

17.13 LPG connected to an appliance by a flexible link should only be installed by a competent person.

18 WASTE MATERIALS

18.1 Good housekeeping is essential on all sites. Waste material, if allowed to accumulate, provides an excellent starting point for fire (ref 39). Therefore, the introduction of combustible waste should be minimised, and all waste packing materials, wood, shavings and oily rags must be removed from the workplace at least once a day. Special attention should be paid to corners, bases of shafts and other out-of-the-way places.

18.2 All non-essential combustible wrapping and packaging should be removed to a safe place away from the working area and be disposed of at the earliest opportunity, and in any case not less than once per day.

18.3 Combustible insulation materials removed from premises during works that are undertaken to reduce the fire hazard to the external façade present a significant fire risk. They should be removed from the site at regular frequent intervals, ideally daily, to prevent excessive amounts accumulating. Whilst awaiting removal they should be stored in a closed skip that is secure outside working hours. See also 18.7.

It is also important that combustible cladding/facades and insulation materials are removed away from the building as they are dismantled and must not be stored on scaffolding, roofs, inside the building, or within underground car parks etc. Wherever possible, cutting panels to smaller lengths for removal and transportation (either in situ or after removal) should be avoided. If cutting cannot be avoided, then this activity shall be performed in the open and not less that 10m from the building using cold cutting tools and in accordance with the hot work controls described in section 16.

18.4 Separate metal bins, with close-fitting metal lids, must be provided for combustible materials such as oily rags.

18.5 Where practicable, rubbish chutes should be constructed outside the building and be of fire-resisting construction. They should be situated so as not to obstruct escape routes.

18.6 Unwanted materials from open areas of a site must be collected at regular intervals.

18.7 All recycling collection points and other combustible waste materials awaiting disposal must be kept in an area as far as reasonably practical away from the building under construction, temporary buildings, smoking shelters, stores and equipment.

18.8 All dry vegetation must be cleared regularly.

18.9 The burning of any vegetation or rubbish on site should be avoided unless absolutely necessary and should only be considered in very limited situations, such as during site clearance.

There is environmental legislation governing the rare circumstances where site burning may be permitted and contractors must check with clients, local authorities and the Environment Agency (or the Scottish Environment Protection Agency (SEPA) in Scotland) before contemplating any site burning.

18.10 All site burning, where permitted, must be subject to a fire risk assessment and be controlled by a permit system (a sample permit is shown in Annex B). The following rules must be built into the permit system:

(a) prior approval and necessary permits must be obtained from all of the relevant authorities;
(b) fires may only be lit on open designated ground and far enough removed (typically 50m) so that there is no risk of setting alight adjoining material, storage areas, flammable liquid stores, plant, structures or neighbouring property;
(c) large open bonfires can easily get out of control; materials must only be burnt in a properly designed incinerator. The incinerator must be sited and maintained in accordance with the manufacturer's recommendations. Regular checks must be made to ensure that the spark arrestor and flue do not become clogged or corroded;
(d) incinerators should not be located beneath overhead cables;
(e) the fire must be extinguished at least one hour before the site closes;
(f) a permanent fire watch must be maintained by a nominated person during the time that the fire is burning;
(g) the nominated person should have a suitable number of appropriate fire extinguishers or other suitable equipment to hand and be trained in their use;
(h) the area must be inspected periodically for at least an hour after the fire has been extinguished before the permit is signed off;
(i) material to be burnt should be checked for dangerous items such as empty cylinders, aerosol cans and flammable substances, which should be removed and safely disposed of before it is brought to the fire; and
(j) flammable liquids should not be used to assist fires.

19 PLANT AND VEHICLES

19.1 Stationary plant powered by internal combustion engines, such as compressors and generators, should be positioned in the open air or in a well-ventilated non-combustible enclosure. They must be sited so that exhaust pipes and exhaust gases are kept clear of combustible materials and should, wherever reasonably practicable, be separated from working areas and other buildings.

19.2 If plant and vehicles are to be refuelled on site:

(a) fuel tanks must not be filled whilst engines are running or hot;
(b) vehicles should only be fuelled in designated, well-ventilated safe areas (see paragraph 14.11); and
(c) fuel should be stored in accordance with section 14.

19.3 Compressors should be housed singly away from other plant and in separate enclosure(s).

19.4 Plant and equipment must be protected against accidental impact.

19.5 Air intakes must be situated so that the air is cool, uncontaminated, and free from flammable gases or vapours.

19.6 Where appropriate, sand trays or similar proprietary non-combustible mineral based absorbing agents should be provided to absorb drips of fuel or lubricant, and changed at regular intervals.

19.7 Vehicles:

(a) as a general rule, the long-term parking of vehicles should not be permitted within 10m of the building under construction and, if possible, a separate car park should be available for workers' vehicles. Under no circumstances should long-term parking be permitted within the building without a suitable and sufficient fire risk assessment being undertaken.
(b) when equipment and materials are being unloaded from or reloaded onto contractors' and sub-contractors' vehicles, such vehicles may be permitted to park on site within 10m of the building for no longer than the duration of unloading or reloading.

20 ELECTRIC VEHICLE CHARGING

20.1 Storage of electric vehicles which utilise lithium-ion batteries to provide power, including cars, vans, bikes, and scooters, shall be prohibited within buildings under construction. If this cannot be avoided, essential electric vehicles shall be stored in a minimum 60-minutes fire-rated compartment, with addressable fire detection, subject to a written fire risk assessment undertaken by a competent person and provision of appropriate ventilation and fire suppression systems.

20.2 The charging of electric vehicles which utilise lithium-ion batteries to provide power should only be undertaken in locations suitably distant from structures and installations, including all buildings under construction.

Charging stations shall be sited in the open, a minimum of 10m from any buildings under construction, temporary buildings, combustible storage and hazardous installations such as transformers, flammable liquid stores and liquefied petroleum gas tanks.

In circumstances where the required separation distance cannot be achieved the location of charging stations should be subject to a risk assessment undertaken by a competent person with suitable controls and mitigation measures implemented as necessary. Where necessary, the main contractor should be consulted to ensure suitable, safe locations can be assured.

General information in relation to the charging of vehicles and equipment containing lead acid batteries is described in RC11 (see Further Reading).

20.3 The use of Electrical Energy Storage Systems (EESS) or Battery Energy Storage Systems (BESS), as an alternative to generators for example, is becoming more prevalent and is likely to increase over time. Information on the hazards and risk control recommendations are described in the 'Need to know guide', 'Battery energy storage systems – commercial Lithium-ion battery installations' – see 'Further Reading'.

21 STORED MATERIALS

21.1 Where it is reasonably practicable to do so, combustible materials should be stored outside the building under construction or undergoing refurbishment, and should not be so close to it that fire is able to spread from the materials to the building. Storing materials in locked metal containers is recommended on all sites, but especially on high fire risk sites.

21.2 Where combustible materials are stored inside the building, the area used for storage should:

(a) have controlled access;
(b) not be in an area where hot work is being carried out;
(c) either be within the area covered by the site fire detection system or be included on the route of regular fire checks; and
(d) have firefighting equipment located close by.

21.3 In addition, the protection of combustible materials with a layer of a material conforming to the requirements of LPS 1207 (ref 13) or Technical Schedule 63 (ref 14) is strongly recommended.

21.4 Where roof systems use combustible materials, storage of these materials on roofs shall be limited to that required for immediate use. If such storage cannot be avoided and combustible materials will be stored on roofs for periods in advance of installation, this must be subject to a specific fire risk assessment and appropriate controls implemented as required.

22 SMOKING

22.1 A 'no smoking' policy must be established throughout the site with the exception of designated area(s) where smoking will be allowed (refs 40-43).

22.2 Where a smoking shelter is provided it must be:

(a) included specifically in the project fire risk assessment;
(b) constructed of non-combustible materials;
(c) situated as far as reasonably practical from any building or structure, but at least 20m on a high fire risk site, where possible;
(d) provided with suitable metal ashtrays and a separate metal waste bin with a fitted metal lid; and
(e) provided with a suitable fire extinguisher.

22.3 The immediate area around the shelter, and the shelter itself, should be kept clear of combustible materials including windblown debris and vegetation. Further information regarding smoking at work is set out in ref 44.

22.4 Raised, slatted floors or decking should not be used, and concealed or semi-open spaces should be sealed to ensure combustible debris cannot accumulate beneath the shelter.

22.5 The use of combustible curtains, canopies and drapes to protect smokers from the elements must be avoided.

22.6 In no circumstances should the shelter be sited near:

(a) windows;
(b) ventilation intakes or extracts;
(c) entrances and exits from the premises;
(d) hazardous materials, including facilities for the storage of flammable liquids and gases;
(e) waste storage containers (such as skips or bins); or
(f) beneath a canopy or low slung eaves.

22.7 Where no shelter is provided, areas where smoking is permitted must be free of combustible materials and be equipped with firefighting equipment, metal ashtrays and a separate metal waste bin with a fitted metal lid.

22.8 A 'no smoking' policy must be established in outside areas where fire hazards exist. Such areas may include refuse and storage areas containing combustible materials, flammable liquids (including refuelling supplies), gas cylinders, foam plastics, fibreboard and timber. 'NO SMOKING' notices must be displayed prominently in these areas.

23 HIGH-RISE CONSTRUCTION SITES

23.1 There are a number of sites (see 4.10) where construction progresses at heights at which normal fire protection measures may not be applicable:

(a) the time taken to escape from the upper levels to a place of safety away from the building in an emergency may be excessive;
(b) incomplete compartmentation of the structure may lead to an inordinately rapid spread of smoke and flames and threaten escape routes; and
(c) there may be inadequate water supplies to fight a fire.

In these circumstances a specific fire risk assessment should be undertaken to develop appropriate provisions, primarily to ensure that people working in the structure can escape safely and without undue delay.

23.2 This specific fire risk assessment should be undertaken by a competent person after consulting with the fire and rescue service, and before work commences at a height at which mechanical rescue by the fire and rescue service is no longer viable.

23.3 Fire doors with self-closers must be fitted to protect the escape stairs in accordance with the findings of the fire risk assessment. These must be in place when the structure reaches the criteria for a high-rise construction site (as defined in paragraph 4.10).

23.4 At this time, at least one staircase should be designated as the firefighting stair, for the exclusive use of the fire service during the course of an emergency. Any firefighting lifts included in the design of the building should be commissioned and brought into service at the earliest opportunity.

23.5 Where reasonably practicable, the building should be horizontally fire compartmented at intervals not exceeding five floors, to prevent the upward (or downward) spread of smoke and flames. This should be done at the earliest practical opportunity after construction of each of the relevant floors, using temporary fire-stopping materials having no less than 60-minutes' fire resistance (integrity and insulation), until the permanent fire-stopping arrangements can be put in place. All holes, shafts and openings should be closed off, including service risers, lift shafts and stairwells. Temporary fire-stopping can be removed to allow construction operations in the area to be carried out, but must be replaced whenever work stops. It should not be left out of place outside site working hours, i.e. at night and at weekends.

23.6 Atriums, stairways, lift shafts and shafts used for crane towers need not be horizontally divided at intervals not exceeding every five floors provided that all openings to floors are fitted with doors with self-closers to provide at least 30-minutes' fire resistance. All other openings between floors and stairways, lift shafts and crane tower shafts should be fire-stopped as indicated above.

23.7 Risers, shafts, ducts and similar openings between floors should be closed off with doors having 30-minutes' fire resistance, to separate them from the floors, and must be fitted at all levels. These doors should be treated in the same way as the temporary fire-stopping mentioned above ie only opened on any given floor when work is actually in progress inside the shaft at that level.

23.8 Early detection and effective response to a fire situation during construction is essential for both life safety and protection of property. As a project progresses to the fit-out stages the fire load and corresponding risk of fire spread increases. To ensure effective early detection and fire response, especially outside of normal working hours, where practicable automatic fire detection should be implemented on a considered risk-based approach. Particular areas of consideration for installation of detection should include designated fire points and areas with increased temporary fire loads. In order to minimise the potential for false fire alarms multi-sensor detectors should ideally be used. They should be installed and sited in accordance

with the manufacturer's instructions and the system remain operational until the permanent fire detection and alarm system is commissioned and live.

23.9 All buildings with a floor level over 18m above firefighting vehicle access level will require the provision of a firefighting shaft(s). Each shaft will be provided with a rising main, and for buildings over 50m the riser is required to be a wet riser fed by duplicate pumps as set out in BS 9990: *Non automatic fire-fighting systems in buildings. Code of practice* (ref 45) so as to provide water in sufficient quantities and at sufficient pressure for effective firefighting. For buildings up to 50m a dry riser may be provided. It should be ensured that as construction progresses operational rising main facilities are provided at each floor level as designed and that inlets and outlets remain unobstructed and accessible for use at all times. Where the height of the building reaches the point where a wet riser is required it should be ensured that the system components including water supplies and pumps are installed and fully operational.

24 LARGE TIMBER FRAME STRUCTURES

Whilst this section is focused on large timber framed structures the risk and mitigations described are broadly applicable to timber framed structures regardless of size.

24.1 Where large timber frame structures are under construction the site security measures set out in section 12 of this code must be adopted.

24.2 When building in timber frame, serious consideration during the design stage should be given to constructing the ground floor from non-combustible construction (concrete, masonry or steel) as a means of reducing risk from low level accidental and deliberate fire raising.

24.3 The use of timber that has received an appropriate pressurised fire protection treatment (such as those certified under the FR Build Certification scheme operated by the Wood Protection Association) should be seriously considered during the design phase of all timber buildings. The design phase should also see consideration not only of the on-site risk during construction but also the off-site risk to premises beyond the site boundary. Further information and guidance is provided in the STA publication 16 steps to fire safety (ref. 46).

24.4 Where multiple large timber-framed structures are being built on one site, the period of maximum vulnerability during which fire may spread from one to another is the time when the structures are incomplete. This hazard must be considered in detail and minimised as part of the fire risk assessment. Suitable sequencing may be appropriate to provide a fire break by separating incomplete structures by those with completed, fire-rated facades.

24.5 The building should be compartmented and fire stopped at the earliest stage possible. This should include party walls, stairwells, service risers, lift shafts, roof voids and other fire-rated sub-compartments throughout the building. Wherever possible this compartmentation should take the form of the final, permanent fire-resisting doors, panels and fire-stopping.

24.6 In cases where it is not possible to fit the final materials early in the construction process, suitable temporary arrangements should be made in order to reduce the spread of fire and smoke up a building through unstopped ducts and shafts. Consideration should then be given to fitting temporary horizontal fire rated boarding as work progresses.

24.7 The final cladding to a building should be put in place at as early a stage as possible.

24.8 Serious consideration should be given to mitigating fire damage and the spread of fire to adjacent structures, by facing exposed timber construction and combustible insulation with fire-rated boarding at the earliest opportunity. The use of fire-rated boarding may be extended to protect windows and door openings not required as means of escape. This approach also provides significant security benefits.

24.9 Generators and similar stationary heat producing equipment should not be used in structures where the timber frame is exposed.

24.10 Refuelling of equipment must be undertaken outside any timber frame structure and in a designated refuelling/storage area located at least 20m from the building.

24.11 At the end of each day, gas cylinders and flammable liquids must be removed from the building under construction and stored in a safe and secure compound, container or cage at least 20m from the structure.

24.12 Temporary buildings closer than 20m to the timber frame structure including those with fire resisting exterior shells, such as converted steel shipping containers, shall meet or exceed the construction specification in section 13.3. Wherever temporary buildings have to be located closer than 20m to the structure, the safe distance and construction specification must be determined by a life and property fire risk assessment carried out by a competent person.

24.13 Heating, drying and dehumidifying equipment must be restricted to 110V blown air type and be removed from the structure outside working hours.

24.14 All power and utilities – apart from those required for fire protection, security and life safety systems – must be turned off outside working hours.

24.15 Automatic fire detection must be installed in enclosed spaces and the system be extended as work progresses on large timber framed structures. Detectors should use multiple sensors to provide a degree of discrimination to minimise unwanted alarm signals. The system must be linked to an alarm receiving centre unless there is a 24-hour security presence on site.

24.16 The use of foam plastic materials on site should be minimised. Fall arrest systems using polystyrene materials must not be used.

24.17 Hot work on timber frame construction sites should be minimised. Where hot work cannot be avoided the controls described in 16.15 and 16.16 should be strictly followed.

ANNEX A

Sample hot work permit and associated Checklist

HOT WORK PERMIT

A copy of the completed permit should be retained for auditing purposes

ISSUING COMPANY **PERMIT NO.**

A. PROPOSAL *(to be completed by the person responsible for carrying out the work)*

BUILDING

EXACT LOCATION OF PROPOSED WORK

NATURE OF WORK TO BE UNDERTAKEN

I understand the scope of work and precautions to be taken.

SIGNED **BLOCK CAPITALS**

DATE **POSITION**

CONTRACTOR COMPANY (WHERE APPLICABLE)

B. AGREEMENT *(to be completed by Company Safety Officer or other nominated person – the 'Issuer of the Permit')*

This Hot Work Permit is issued subject to the following conditions:

ISSUE OF PERMIT: **DATE** **TIME**

EXPIRY OF PERMIT*: **DATE** **TIME**

* It is not desirable to issue permits for protracted periods. Fresh permits should be issued where, for example, work extends from morning to afternoon.

A FINAL CHECK OF THE WORK AREA SHALL BE MADE, NOT BEFORE (TIME):

ADDITIONAL CONDITIONS REQUIRED:

The above location has been examined and the precautions listed on the reverse side of this form** have been complied with. I have carried out a risk assessment and consider that there is no reasonably practical alternative to doing the job using hot work. I have been provided with evidence of appropriate Public Liability Insurance.

SIGNED **BLOCK CAPITALS**

DATE **POSITION**

C. FOLLOWING COMPLETION OF WORK *(to be completed by member of staff or contractor responsible for the work. The permit should then be returned to the Issuer)*

The work area and all adjacent areas to which sparks and heat might have spread (such as floors below and above and areas on other sides of walls) have been inspected and found to be free of smouldering materials and flames. ☐

Stub ends of welding rods and other hot waste materials have been removed and disposed of safely. ☐

Any isolated automatic fire detectors or detection zones have been reinstated. ☐

All equipment, including gas cylinders, has been removed to a safe area. ☐

TIME INSPECTION COMPLETED: *(this must be at least 60 minutes after work has been completed followed by further checks being made at regular intervals of no more than 20 minutes, up to 120 minutes (or more where determined necessary through risk assessment) after cessation of hot work)*

SIGNED **BLOCK CAPITALS**

DATE **POSITION**

CONTRACTOR (WHERE APPLICABLE)

D. SIGN OFF BY ISSUER OF PERMIT

The hot work has been completed. Any detector(s) or zones of the fire alarm system that were isolated have been fully reinstated.

SIGNED **BLOCK CAPITALS**

DATE

** The conditions listed in section 16 should appear on the reverse of this permit form.

HOT WORK PERMIT – CHECKLIST

The following checks should be carried out by the hot work operative at the hot work site prior to commencing hot work. The person carrying out these checks should tick the appropriate boxes, and then return the Checklist to the Hot Work Permit issuer.

ISSUING COMPANY **PERMIT NO.**

GENERAL

Wherever practicable the use of hot work should be avoided and a safer way employed. If you cannot comply with the following points, do not go ahead with the hot work.

FIRE PROTECTION

- Where sprinklers are installed, they are operative. (In sprinklered premises, hot work should not be carried out when the water supply to the sprinkler system is shut off.)
- Where an automatic fire detection system has been installed, it will be kept operative.Only the zone where the hot work is being carried out will be isolated for the period whilst hot work is in progress.
- A dedicated trained person not directly involved with the work will provide a continuous fire watch during the period of hotwork. Following completion of each period of the work, the continuous fire watch will remain in place for at least 60 minutes after work is completed, followed by further checks being made at regular intervals, of no more than 20 minutes, up to 120 minutes (or longer where determined necessary through risk assessment) after cessation of hot work, before the permit is signed off. This is to ensure that the working area and all adjacent areas, including the floors below and above, and areas on the other sides of walls, screens, partitions and above false ceilings are free of smouldering materials and flames. The fire watch periods should be extended where this has been determined necessary by a suitable and sufficient fire risk assessment.
- At least two appropriate extinguishers are immediately available. The personnel undertaking the work and providing the fire watch are trained in their use.
- Personnel involved with the work and providing the fire watch are familiar with the means of escape and method of raising the alarm/calling the fire brigade.

PRECAUTIONS WITHIN 10 METRES (MINIMUM) OF THE WORK

- Combustible materials have been cleared from the area. Where materials cannot be removed, protection has been provided by non-combustible or purpose-made blankets, drapes or screens.
- When welding, cutting or grinding, the work area must be suitably screened using a non-combustible material such as welding protection screens or welding blankets wherever practicable. Subject to a written risk assessment undertaken by a competent person, temporary protective covering materials as described in Section 10 may be used in circumstances where the use of non-combustible materials is not practicable.
- Flammable liquids have been removed from the area.
- Floors have been swept clean. Combustible floors have been covered with overlapping sheets of non-combustible material or wetted and liberally covered with sand. All openings and gaps (combustiblefloors or otherwise) are adequately covered.
- Protection (non-combustible or purpose-made blankets, drapes or screens) has been provided for:
- walls, partitions and ceilings of combustible construction or surface finish; and
- all holes and other openings in walls, partitions and ceilings through which sparks could pass.
- Where work is being carried out on building panels, an assessment has been made of insulating or other materials behind or forming the core of the panels.
- Combustible materials have been moved away from the far side of walls or partitions where heat could be conducted, especially where these incorporate metal.
- Enclosed equipment (tanks, containers, dust collectors etc) has been emptied and tested, or is known to be free of flammable concentrations of vapour or dust.
- Thermographic inspection implemented for hot work in fire-susceptible locations with potential for concealed burning before the work is undertaken, during and after the work (as part of the fire watch), checking the area for any potential hot spots. Photographs should be held on record.
- In areas where flammable and combustible liquids and vapours might be present, air monitoring has been implemented to ensure that flammable vapours at concentrations likely to enable their ignition are not present. Concentrations must be less than 10% lower explosive limit (LEL) before commencing and during the hot works.

EQUIPMENT

Equipment for hot work has been checked and found to be in good repair. Gas cylinders have been properly secured.

SIGNED **BLOCK CAPITALS**

DATE

ANNEX B

Sample permit to burn waste materials

WASTE BURNING PERMIT

A copy of the completed permit should be retained for auditing purposes

ISSUING COMPANY **PERMIT NO.**

A. PROPOSAL *(to be completed by the Responsible Person or Fire Marshal)*

EXACT LOCATION OF PROPOSED BURNING

I understand the precautions to be taken.

SIGNED **BLOCK CAPITALS**

DATE **POSITION**

CONTRACTOR (WHERE APPLICABLE)

B. AGREEMENT *(to be completed by the Nominated Person for burning the waste)*

This Waste Burning Permit is issued subject to the following conditions:

ISSUE OF PERMIT: **DATE** **TIME**

EXPIRY OF PERMIT*: **DATE** **TIME**

* The time of expiry of the permit should be not less than 60 minutes before the work period terminates. Fresh permits should be issued in respect of separate fire in the same work period.

A FINAL CHECK OF THE WORK AREA SHALL BE MADE, NOT BEFORE (TIME):

The above location has been examined and the conditions listed on the reverse side of this form** have been complied with. I have carried out a risk assessment and consider that there is no reasonably practical alternative to burning the waste on site. I have been provided with evidence of appropriate Public Liability Insurance.

SIGNED **BLOCK CAPITALS**

DATE **POSITION**

CONTRACTOR (WHERE APPLICABLE)

C. FOLLOWING COMPLETION OF WORK *(to be completed by the Nominated Person before returning the permit to the Issuer)*

The area in which the waste was burned and all adjacent areas have been inspected and found to be free of smouldering materials. ☐

TIME INSPECTION COMPLETED: *(this must be at least 60 minutes after the fire has been extinguished)*

SIGNED **BLOCK CAPITALS**

DATE **POSITION**

CONTRACTOR (WHERE APPLICABLE)

D. SIGN OFF BY ISSUER OF PERMIT

The burning of waste materials has been completed

SIGNED **BLOCK CAPITALS**

DATE

** The conditions listed in section 18.10 should appear on the reverse of this permit form.

REFERENCE DOCUMENTS

1. *Protecting the public – your next move*, HS(G)151, 2009, Health and Safety Executive.
2. Management of Health and Safety at Work Regulations 1999, SI 1999 No 3242 (as amended), The Stationery Office.
3. Regulatory Reform (Fire Safety) Order 2005 SI 2004 No 1541, The Stationery Office.
4. Fire Safety Act 2021, The Stationery Office.
5. Fire (Scotland) Act 2005, asp5, The Stationery Office.
6. Fire Safety (Scotland) Regulations 2006, Scottish SI 2006 No 456, The Stationery Office.
7. The Fire Safety Regulations (Northern Ireland) 2010, Statutory Rules of Northern Ireland 2010 No 325, The Stationery Office.
8. Dangerous Substances and Explosive Atmosphere Regulations 2002 (DSEAR) SI 2002 No 2776, The Stationery Office.
9. Construction (Design and Management) Regulations 2015, SI 2015 No 51, The Stationery Office.
10. *Guide to Fire Safety Signs*, 5th edition, 2014, Fire Protection Association.
11. BS EN 12845: 2015: *Fixed firefighting systems. Automatic sprinkler systems. Design, installation and maintenance*, British Standards Institution.
12. BS EN 13501-1: 2019: *Fire classification of construction products and building elements – Classification using data from reaction to fire tests*, British Standards Institution.
13. Loss Prevention Standard 1207, Issue 3.1: 2014: *Requirements for the LPCB approval and listing for fire performance of temporary protective covering materials for use in the interior of buildings*, BRE Certification.
14. Technical Schedule 63, *Reaction to fire performance requirements: materials used as temporary protective covering, CERTIFIRE product certification scheme*, Warringtonfire Certification and Testing Ltd.
15. Loss Prevention Standard 1215, Issue 4.1: 2014: *Requirements for the LPCB approval and listing for fire performance of containment net and sheet materials for external use on construction sites*, BRE Certification.
16. Technical Schedule 62, *Reaction to fire performance requirements: materials used to clad scaffolding, CERTIFIRE Product certification scheme*, Warringtonfire Certification and Testing Ltd.
17. BS 5306-8: 2012: *Fire extinguishing installations and equipment on premises: Selection and positioning of portable fire extinguishers: Code of practice*, British Standards Institution.
18. BS 5306-3: 2017: *Fire extinguishing installations and equipment on premises: Commissioning and maintenance of portable fire extinguishers, Code of practice*, British Standards Institution.
19. BS 7499: 2020: *Provision of static guarding security services. Code of practice*, British Standards Institution.
20. BS 7858: 2019: *Screening of individuals working in a secure environment. Code of practice*, British Standards Institution.
21. BS 8418:2015+A1:2017: *Installation and remote monitoring of detector-activated CCTV systems. Code of practice*, British Standards Institution.
22. *Code of practice for the protection of empty buildings: fire safety and security*, 2008, Fire Protection Association on behalf of RISCAuthority.
23. BS EN 13501-2: 2016: *Fire classification of construction products and building elements – Classification using data from fire resistance tests, excluding ventilation services*, British Standards Institution.

24. BS EN 1366-4: 2021: *Fire resistance tests for service installations – Linear joint seals*, British Standards Institution.

25. BS EN 13501-5: 2016: *Fire classification of construction products and building elements – Classification using data from external fire exposure to roofs tests*, British Standards Institution.

26. *The Building regulations 2010, Approved Document B Fire Safety, Volume 2: Buildings other than dwellings*, 2019, RIBA Books.

27. BS 5839-1: 2017: *Fire detection and alarm systems for buildings: Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises*, British Standards Institution.

28. BS EN 54: *Fire detection and fire alarm systems* (several parts), British Standards Institution.

29. SS2004: *Code of practice for temporary alarm systems*, 2012, SSAIB.

30. RC30, *Recommendations for the selection of electrical and non-electrical equipment for use in atmospheres containing flammable and explosive gases or vapours*, 2005, Fire Protection Association on behalf of RISCAuthority.

31. RC49, *Recommendations for the storage, handling and use of acetylene cylinders*. 2016, Fire Protection Association on behalf of RISCAuthority.

32. RC7, *Recommendations for Hot work*, 2019, Fire Protection Association on behalf of RISCAuthority.

33. *Hot work training video*, 2021, Fire Protection Association and RISCAuthority.

    This 25 minute video instructs the user on what constitutes hot work; where safety requirements apply; what the dangers are; completing the hot work permit; and roles and responsibilities on site. Updated with new video footage pertinent to a modern-day construction site, this video is offered free of change to assist in the battle against hot work related losses.

34. *Hot work site induction toolkit*, 2021, RISCAuthority.

    This software is designed to ensure best practice risk control processes are understood by all entering a site. Located on a PC with printer and camera at reception, the software elicits information from those entering a site to conduct hot works and takes them through a hot works safety video, before asking them to complete a series of questions to demonstrate they have watched and understood what is required of them. If they answer enough questions correctly, then a photo ID, time limited certificate is issued to them which also contains important emergency site contact details.

35. BS EN ISO 25980: 2014: *Health and safety in welding and allied processes. Transparent welding curtains, strips and screens for arc welding processes*, British Standards Institution.

36. BS 7671: 2018: *Requirements for electrical installations. IET Wiring Regulations*, British Standards Institution.

37. Electricity at Work Regulations 1989, SI 1989 No 635, The Stationery Office.

38. *Fire safety in construction*, HS(G)168, 2022, Health and Safety Executive.

39. *Fire safety and waste materials*, 2003, Fire Protection Association.

40. Smoke-Free (Premises and Enforcement) Regulations 2006, SI 2006 No 3368, The Stationery Office.

41. Smoke-Free Premises etc. (Wales) Regulations 2007 (as amended), SI 2007 No (W), National Assembly for Wales.

42. Prohibition of Smoking in Certain Premises (Scotland) Regulations 2006, SSI 2006 No 90, The Stationery Office.

43. Smoking (Northern Ireland) Order 2006, SI 2006 (as amended) No 2957 (NI20), The Stationery Office.

44. RC51, *Recommendations regarding smoking at work*, 2013, Fire Protection Association on behalf of RISCAuthority.

45. BS 9990: 2015: *Non-automatic firefighting systems in buildings. Code of practice*, British Standards Institution.

46. *16 steps to fire safety*, 2017, Structural Timber Association.

FURTHER READING

- *Fire safety on timber frame construction sites* (version 3), 2013, TRADA.
- *Construction Health & Safety Manual*, Construction Industry Publications Ltd.
- *UK Fire & Rescue Service Guidance – Acetylene cylinder procedure*. https://www.ukfrs.com/guidance/search/acetylene-cylinder-procedure.
- PAS 8672. *Built environment – Framework for competence of individual Principal Contractors – Specification*, British Standards Institute.
- *Need to know guide – Battery energy storage systems – commercial Lithium-ion battery installations*, 2022, RISCAuthority.
- RC11, *Recommendations for fire safety in the use of lift trucks*, 2014, Fire Protection Association on behalf of RISCAuthority.

The FPA also publishes the *Construction Site Fire Prevention Checklist*, which can be used to carry out site fire safety checks within the terms of this *Joint Code of Practice*.

INSURANCE PROVISIONS RELATED TO THE JOINT CODE OF PRACTICE

If an insurance policy provides cover for a site where the *Joint Code* is in operation, such a policy should normally contain an endorsement noting this, and outlining the respective rights and responsibilities of Insured and Insurer.

There is no mandatory version of such policy endorsement, and no requirement for any endorsement to be used. A model form is shown below. The form may need to be adapted to ensure consistency with the terms and conditions and terminology used in the balance of the policy wording.

Joint Code of Practice on the Protection from Fire of Construction Sites and Buildings Undergoing Renovation

The following endorsement is added to the policy.

The insured undertakes to comply with the *Joint Code of Practice on the Protection from Fire of Construction Sites and Buildings Undergoing Renovation* dated October 2015 or any subsequent amendment thereto or revised edition thereof current at inception or subsequent renewal of the policy hereinafter referred to as the *Joint Code*.

The appointed representative of the company shall have the right at all reasonable times to enter and inspect any construction site insured under the policy for the purpose of checking whether the conditions thereon in all respects comply with the *Joint Code*.

In the event of the company becoming aware of a breach of the *Joint Code* the company will inform the employer or his representative and the main/management contractor's construction site management of the nature of the breach specifying the remedial measures required by the company (the remedial measures) and the period within which these must be completed.

Where the company considers such a breach is of sufficient importance the company will confirm the same by notice in writing to the employer and main/management contractor at their respective addresses nominated by the insured at the inception of cover or as subsequently amended.

Under the terms of this or any subsequent notice, the company may suspend or cancel all cover under the policy from the date named in the notice not being a date earlier than the date named for the completion of the remedial measures it being understood that upon suspension such cover shall be reinstated when the company is satisfied that the remedial measures have been completed. Such notice shall be given by registered post recorded delivery, facsimile transmission or by hand.

The reference to suspension or cancellation of all cover shall apply only to the contract specified in the notice.

This endorsement shall not in itself be considered a condition precedent to liability but its inclusion shall not prejudice, waive or remove the rights of the company under the terms of other policy exclusions and conditions.

This endorsement does not apply to any public liability employer's liability or 21.2.1 insurance provided by the policy.

In the event of cancellation, only the company agrees to return to the Insured a pro rata proportion of the relevant part of the policy premium.

Subject otherwise to the terms exclusions and conditions of this policy.

Fire Prevention on Construction Sites

Tenth edition incorporating Amendment 1

This *Joint Code of Practice* on the protection from fire of construction sites and buildings undergoing renovation contains a series of measures which, if adopted, will ensure that adequate detection and prevention systems are incorporated during the building design and planning stages and that work on a site is undertaken to the highest standard of fire safety.

Contents: notes to tenth edition incorporating Amendment 1; objective of the code; compliance with the code; introduction; definitions used in this code; design phase; construction phase; liaison with the emergency services; emergency procedures; fire protection; temporary protective covering materials; portable fire extinguishers; site security against arson; temporary buildings and temporary accommodation; site storage of flammable liquids and LPG; acetylene; hot work; electricity and gas; waste materials; plant and vehicles; electric vehicle charging; stored materials; smoking; high-rise construction sites; large timber frame structures.

RISCAuthority

FPA Fire Protection Association

CLG Contractors Legal Group