LONDON FIRE BRIGADE

Fire Safety Guidance Note: GN80
Heritage and Buildings of Special Interest

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Contents

The London Fire Commissioner (the Commissioner) is the fire and rescue authority for London. The Commissioner is responsible for enforcing the Regulatory Reform (Fire Safety) Order 2005 (The Order) in London.

This Guidance Note provides information on historic buildings and the damage control / salvage of artefacts and collections.

This Note is one of a series produced by the Commissioner to provide advice on various aspects of fire safety. If you require any further guidance on the advice given or require advice on another topic please visit your local Fire Safety Office, telephone 020 8555 1200 and ask for the nearest Fire Safety Office, or visit the London Fire Brigade web site at http://www.london-fire.gov.uk.

1 Historic and Listed Buildings

1.1 Historic buildings can be defined as buildings of architectural or historic interest/ significance. The interest or significance may be:

(a) local or national

(b) a consequence of the building's age, build form or location.

(c) may result from its connection with a person or persons, or with local or national events or industry;

1.2 'Listed' Building is a term used to describe one of a number of legal procedures which help Historic England to protect our architectural heritage. When buildings are listed they are placed on statutory lists of buildings of "special architectural or historic interest" compiled by the Department of Digital, Culture, Media and Sport under the Planning (Listed Buildings and Conservation Areas) Act 1990, on advice from Historic England. To carry out works affecting the special character of a listed building without consent from the Local Authorities (LA) is a criminal offence even if the responsible person was not aware the premises was listed.

1.3 Listed buildings are graded to show their relative importance:

(a) Grade I - Buildings of exceptional interest (around 2% of all listed premises)

(b) Grade II* - Particularly important of more than special interest (around 4%)

(c) Grade II - Buildings of special interest warranting every effort to preserve them.

1.4 All of the properties that Historic England inspect, are judged according to a set of national standards. Broadly, buildings that are eligible for listing are as follows:

1. All buildings built before 1700 which survive in anything like their original condition
2. Most buildings of 1700 to 1840.
3. Between 1840 and 1914 only buildings of definite quality and character.
4. Between 1914 and 1939, selected buildings of high quality or historic interest.
5. A few outstanding buildings erected after 1939.

1.5 Managing these parts of the historic environment valued by local communities is an important element of the heritage protection system. Local designation allows for the management of local heritage through the planning system. It encompasses both individual assets identified by local listing right through to areas of local character represented by conservation areas.

1.6 Conservation Areas are spaces that planning authorities have a duty to identify and designate as areas of historic or architectural interest and to ensure that development preserves or enhances the character of those areas. A building does not have to be listed or lie within a conservation area to be of special or significant interest.

2 Enforcing Authorities

2.1 If the premises is being constructed or altered, it will be subject to Building Regulation approval administered by the Local Authority (LA) Building Control office, or an approved inspector under the Building and Approved Inspectors (Amendment) Regulations 2010.

2.2 In relation to Crown premises there is a direction from the Secretary of State which means all government departments shall follow the building regulations procedure as though they are bound by it.

2.3 There are also other enforcing authorities who have legislative control over certain premises and, depending on the use of the premises, they may need to be consulted before any works are undertaken. These include:

(a) Fire & Rescue Services;

(b) Health and Safety Executive (e.g. construction sites);

(c) Crown Premises Inspection Group (CPIG);

(d) MOD fire service (e.g. army base);

(e) Local Authority (LA) Conservation Officer;

(f) Historic England (if the building is listed as being of historical interest);

(g) The Secretary of State for the Environment.

2.4 All LAs in London should have dedicated Conservation/Planning teams who manage listed buildings on behalf of Historic England. Discussions should be held with the local conservation officers before any changes are made to a listed building.

3 Fire Safety Arrangements

3.1 Fire Safety arrangements include an emergency plan and a fire safety manual, can vary in its scope and detail according to the size and complexity of the premises. The manual should be easy to understand, kept current and should be accessible to any authorised person who needs to use it.

3.2 In smaller premises, the fire safety manual might comprise of a simple contact list and emergency procedures.

3.3 In large premises, such as museums, art galleries and houses containing collections, it should be a comprehensive manual including the following elements:

(a) Fire Risk Assessment

(b) Fire Strategy

(c) Fire Safety Engineering

(d) Emergency Evacuation Procedures

(e) Salvage/Damage Control

(f) Working with the Fire Rescue Service

(g) Business Continuity Plan

(h) Emergency Contact List

4 Fire Risk Assessment

4.1 The Regulatory Reform (Fire Safety) Order 2005 (the Order) came into effect in 2006. The Order is enforced by a number of organisations but the primary enforcer is the local Fire and Rescue Service (FRS) and the Order is bound in criminal law.

4.2 The Order requires an assessment of the fire risks in a premises or part of a premises. A Fire Risk Assessment (FRA) is required for all premises falling within the scope of the order. The Order imposes a duty on the Responsible Person (RP) to have a fire risk assessment carried out by a competent person. The criteria set out by the Competency Council is a good starting point for choosing a competent Risk Assessor and a copy of "**A Guide to Choosing a Competent Fire Risk Assessor**" can be found on our web site.

4.3 The RP will be the employer in places of work and either the occupier or owner in other cases. For further information of how to carry out a FRA please see the London Fire Brigade Guidance Note 66.

4.4 The obligation to ensure the safety of the occupants and the moral duty to protect the building from fire often gives rise to conflict. The FRA can be the key to striking a balance between the requirements for life safety and the need for property protection through the use of the Order. Other assessments for property protection and business continuity in relation to fire may need to be carried out to ensure that the character of the historic building is retained. Protecting the environment should also be a consideration especially regarding fire fighting water run off, smoke and fire debris and hazardous contamination. Any significant change to the building or deviation from current guidance or British Standard needs to be fully developed and justified within the fire risk assessment, to see whether it is possible to achieve safely. At no time should a deviation take place without a full and detailed review of the fire risk assessment and/or fire strategy.

4.5 The key to reducing loss in traditional buildings is gaining an understanding of the most common causes of fire. This can include accidental or deliberate causes and individual sources of ignition. Traditional buildings can be particularly vulnerable to fire in numerous ways, however the following represent some of the more common causes of fires and common risks in the building makeup.

4.6 Building or maintenance work have been the cause of several major fires due to careless application of heat and hot works. Lead work to roofs, plumbing and paint stripping present particular risks. Hot work should be avoided or strictly controlled and monitored. It is recommended that hot works are carried out away from the building where possible. Where building works are taking place the additional hazards presented by the works should be addressed. These could include:

(a) Loss of fire separation caused by the removal of doors or repair of partitions or ceilings;

(b) Temporary isolation of fire detectors to avoid false alarms caused by dust;

(c) Additional fire loading caused by the temporary storage of building materials and packaging;

(d) Additional sources of ignition caused by temporary lighting, plumbing works, sparks from cutting gear, burning paint and lead burning. Poor water supplies because hydrants have been covered or have not yet been fitted;

(e) Poor access because of temporary hoarding or site huts;

(f) Fire precautions not yet in place.

4.7 Electrical faults are considered to be a major fire hazard. In many buildings the wiring itself may be of considerable age and may deteriorate over time. Alterations over a period of years, or circuits becoming overloaded by the connection of too many appliances, can lead to installations becoming unsafe. Faulty appliances can be a source of fire and consequently electrical appliances require regular checking and maintenance. Older style and types of fuses in Consumer units should be upgraded to modern standards with Residual Current Circuit Breakers (RCBs) fitted in line with the current BS7671 Wiring Regulations.

4.8 Open fires, stoves, grates and hearths are a serious risk. Many fires have started with a spark from a fire or because of a cracked hearth.

4.9 Defective flues, chimney fires are common and fire can spread to other parts of the building due to cracked or faulty flues or where timber joists project into the flue way. Birds' nests in flues have also resulted in fires.

4.10 In addition to flues (often a concern due to their frequent poor condition and the presence of hot gases and sparks) other long forgotten ducts or shafts may be part of the original construction - waste shafts, natural ventilation stacks, bell pulley routes and dumb waiters. Such voids, often interconnecting, are extremely hazardous to a traditional building, providing fire, smoke and the products of combustion with an easy route by which to spread.

4.11 Fire-stopping / dampers - Traditional buildings rely on relatively high air change rates to ensure that damp and rot are kept at bay, and upsetting this balance may have far-reaching consequences. One way to avoid such unwanted side effects is to use mechanically or electrically operated fire dampers that operate to close off ducts when a fire is detected. Where it is not possible to remove services, attention is required to build-up openings, "fire stop" holes, restore compartmentation and other finishes and where necessary fit fire dampers to ducts or fire collars to pipework.

4.12 When hiring out rooms/areas etc. within a premises full consideration needs to be given to what risks and hazards may be introduced into the premises. There should be clear co-operation and co-ordination between the RP and the function organiser to make sure that everyone is aware of the findings of the relevant fire risk assessments and evacuation procedures for the premises. If there is an increase in numbers of people during an event the fire exits and escape routes will need to be re-assessed. A further FRA needs to be undertaken by the function organiser to assess the fire protection arrangements for the event.

5 Fire Strategy

5.1 It is recommended, particularly in complex buildings, that an overriding strategy document is created. Fire strategies can be prepared in a variety of formats and level of detail, but ultimately they aim to formalise the base fire safety requirements for a premises or site. This can then be used to help inform more detailed fire protection specifications, fire risk assessments and emergency plans, and other relevant building strategies (for example, a building's security strategy).

5.2 Fire strategies primarily focus on life safety requirements, but may consider property protection, environmental and business continuity factors. They can be based upon prescriptive or performance based design criteria, or a hybrid of both. In the context of heritage and buildings of special interest, fire strategies can be a useful tool for ensuring that the required level of fire safety prevention and protection is effectively implemented and managed in a consistent manner.

5.3 It is important to note that the fire strategy for one premises may not be applicable/ transferable to another, thus it is imperative that a fire strategy considers and develops the overall fire strategy package for an individual premises or site on a case specific basis.

5.4 The creation or review of a fire strategy should only be completed by a competent person.

5.5 The type of occupancy is a key factor in the fire strategy. Occupancy can include the following:-

(a) Members of the public and staff.

(b) Some heritage buildings have key representatives living on site, such as the curator or house and collections manager. They are the first line of defence from a fire and security perspective.

(c) Some heritage properties may have a holiday apartment incorporated into it or be a rental property for guests in its entirety.

(d) Some heritage buildings have the donor family still living in residence, sometimes in private apartments and therefore these parts do not come under the auspices of the Order and any Fire Risk Assessment would not consider these areas although they may be part of the building. However, in regards to property or business assessments, there may well be a separate assessment to cover this area.

6 Fire Safety Engineering

6.1 In some cases the only practical way for a historic building to achieve a satisfactory standard of fire safety and fulfil the requirements of the Order 2005 and/ or Building Regulations is to adopt a fire safety engineered solution.

6.2 Fire safety engineering/ performance based design solutions often adopt a more holistic and systematic approach to a fire safety problem than typical prescriptive methods. For example, British Standard (BS 7974) or CIBSE Guide E provides a framework and guidance on the design and assessment of fire safety measures needed to support a fire engineered design solution.

6.3 By using fire safety engineering, a building specific fire strategy can be developed based upon quantitative and qualitative scientific and engineering principles, which consider:

(a) The likelihood of a fire occurring.

(b) The anticipated fire development and severity.

(c) The performance of a building's structure and fire safety systems during a fire.

(d) The potential response and behaviour of occupants within a building during a fire, and fire service intervention.

6.4 A wide variety of fire protection measures could be applied as part of a fire engineered solution, with the appropriate combination/ level of measures being determined through the development of the building specific fire strategy and associated fire risk assessment(s).

6.5 If it is thought that a fire safety engineering solution is desirable or required in a historic building, then the responsible person should seek further guidance from a suitably competent and qualified fire engineer.

7 Passive Fire Safety

7.1 Compartmentation is the division of a building into separate fire compartments, using fire resisting walls, partitions and ceilings. This is to limit the size of fire and to stop it spreading from one part of the building to another, or into staircases and other exit routes. Examination of most buildings will show that each has its own natural lines of compartmentation, which can be utilised to provide separation elements that, with a little attention, are capable of providing a level of fire protection, and may, in some cases, provide an hour or more. It follows that, when deciding on a compartment strategy for the building, a full understanding of the location of all the hidden voids should be available to those responsible for the decisions.

7.2 Where services pass through a compartment floor, wall or cavity barrier then fire stopping should be provided to maintain (60min) fire-resistance. All pipes should be fitted with a proprietary sealing system capable of maintaining the fire-resistance of the floor, wall or cavity barrier. Any door in compartment walls should be fire resisting or be able to resist the passage of fire for the designated period and should not be propped or wedged open. They should self-close effectively to sit squarely within the frames. Any excessive gaps caused by warping or dropping of the hinges should be reported for remedial action. Holes in compartment walls or ceilings, formed for the passage of cables or pipes should be fire stopped to the appropriate standard.

7.3 Roof and roof voids are also an important feature of the fire resistance characteristics of any building, making their investigation an important aspect of the fire risk assessment. Compartmentation of the roof void is an essential element of upgrading the fire performance of the building. Installing fire-insulating barriers that do not line up with the existing compartment lines in the accommodation below will undermine the fire integrity of the structure.

7.4 The existence of hidden voids is sometimes very difficult to ascertain, but original plans of the building may reveal where they can be found. The problem with these voids is that they form hidden paths for fire, smoke and the products of combustion to spread unnoticed to parts of the building quite remote from the place of origin. The fact that the fire is hidden also makes it almost impossible to tackle without a major dismantling of the building fabric.

7.5 Floor construction in traditional buildings presents a special area of vulnerability. Apart from a small number of buildings that have stone or brick vaulted floors with excellent fire resistance, the most common floor constructions in traditional buildings are of timber construction. Early forms of construction lacked an applied ceiling, with the floor boarding itself laid over the joists providing little fire resistance. The protection offered by a floor to a fire from below depends on the plaster ceiling. The age and condition of the plaster and the strength of its key to the lath will greatly affect its ability to perform in fire.

7.6 Upgrading the fire resistance of a floor can be a difficult task, which may result in some loss of historic fabric, but there are a number of recognised upgrading methods:

(a) Consolidate any deficiencies in the original construction,

(b) Introduce mineral fibre quilt supported between or below the joists,

(c) Insert intumescent sheet material over or under existing surfaces,

(d) Insert intumescent material at the perimeter of the floor to close the link with the wall cavities in the event of a fire,

(e) Apply intumescent coatings to ceilings,

(f) Apply additional layers of fire resistant boards to ceilings.

7.7 Thick stone walls have a great resistance to the passage of smoke, heat and flame. However, in many buildings numerous flues and other voids weaken their integrity in fire. The common construction of walls lined with lath and plaster or timber panelling creates narrow continuous cavities, and these present one of the most vulnerable elements in terms of fire resistance. The cavities often link with those present in floors and can run throughout a building, giving an easy fire path with both fuel (timber) and air present. A fire can smoulder unnoticed for many hours before breaking out some distance from the actual point of origin.

7.8 Many compartment walls do not continue up into the roof void, or are compromised by openings, thus permitting the unhindered and rapid spread of fire along the roof space.

7.9 The height of the ceiling has a dramatic effect on the spread of smoke and flames and if sufficiently high will delay the moment when hot smoke starts to descend from ceiling level and mushroom out. The heat in the smoke plume could affect doors and break down the fire resistance. If the windows are higher than the tops of the doors, the heat from the fire could break the glass and allow the hot smoke and gases to vent.

7.10 Surface spread of flame rating of walls and ceilings has an impact on the speed of growth of fire within compartments. Full height timber panels and other wall coverings e.g. wallpaper, layers of paint, artefacts and tapestries can give flames a path from low level to ceiling height, so encouraging rapid fire spread.

7.11 If a door should be a fire door but does not meet that standard, then advice should be sought from a competent person to explore whether the existing door is of adequate solid construction to resist the passage of fire, thus making it a Notional fire door. There is still the expectation that Intumescent strips and cold smoke seals will be fitted to the door or the door frame. Or the door can be upgraded in order to achieve the appropriate fire resisting performance. Despite frequently being of intrinsic historic value, doors are often the fundamental weakness in a separating wall. Doors and frames that have gaps in their construction, or contain glazing that is not fire resistant, may readily allow fire to spread beyond the compartment of origin.

7.12 There are a number of techniques that can be employed to improve the fire resistance of a door (remedial joinery work is also often required). It is advised that advice is received from a specialist in relation to this.

7.13 There may be some situations where it is not practical to improve the fire resistance of a door, either because of its method of construction or because its intrinsic value makes an alteration unacceptable. In the latter situation and as a last resort, the doors might be removed and placed in storage keeping the doors safely in a controlled environment to prevent damage or distortion, preferably in the building itself.

7.14 Listed building consent may be required in the case of some buildings, and it may be found that some alternative use, or the blocking up of the side that is of importance behind doors that are fixed shut, offer a more appropriate outcome. Situations such as this can occur for a variety of reasons. In buildings which have undergone changes in use and/or design it is quite common to find door sets in openings which were not intended for that purpose. Structural openings were sometimes oversized to allow flexibility in deciding where ultimately to locate the doors at a later

stage in the building process. Large door sets often have brick arch openings covered with decorative panelling. Sometimes voids exist behind the frame assembly.

7.15 When asked to upgrade a door it is important to consider the whole door set, including the voids behind the frame.

7.16 The structural stability of a door in a fire resistance test is related therefore to the size of the door (height, width and thickness) and the size of the stiles and rails. Doors can be upgraded to provide the required level of fire resistance using the same principles. This should be done in collaboration with a suitably qualified expert.

7.17 Every effort should be made to retain historic glass and replacement should be seen as an option of last resort. Any glass removed should be handled carefully and stored for repairs or reuse. During a fire, glass can melt in intense temperatures, or shatter due to gaseous explosions/thermal shock. Glazed openings are a potential weakness in the passive control of fire in otherwise sealed compartment walls. The range of options that could be considered includes improvements to the way glass is held into its frame, provision of secondary glass and frames and replacement of existing glass with thicker or fire resistant glass. Fire resistant glass is available in several forms, including 'wired' glass, modified toughened or laminated glass and insulated glass, to comply with BS 476: Part 22: 1987.

7.18 Traditional buildings often have a substantial amount of timber. Timber has a degree of fire resistance that increases with the thickness of the component under attack. Therefore, whilst thin timbers such as window shutters and door panels, decorative wall lining boards and other trims will readily burn, large timber stud frames, and structural elements such as beams, columns and roof members will burn at a slower rate and may perform their function for longer and even beyond the duration of the fire. The fire performance of timber can be adversely affected by factors such as rot or woodworm.

7.19 Traditionally, plaster was applied directly onto solid masonry, but later the primary technique employed was lath and plaster. This involved applying plaster to a timber frame, comprising thin strips (laths) that were nailed to upright studs attached to the wall. A cavity was left between the wall and plaster. Whilst theoretically giving a good level of fire resistance, the performance of traditional plaster is usually reliant on the condition of the mechanical bond ('key') between the plaster and laths, and if lost, plaster will start to detach. Performance in a fire may be unpredictable and at a certain stage in a fire complete failure may occur.

8 Active Fire Safety

8.1 Once consideration has been given to the passive fire safety within the building, the next step is to look at the active fire safety measures which might be present or may be needed.

8.2 The introduction of fire protection systems, to improve the fire performance of the building, should only be done after the following points have been considered:

(a) Essential: The fire systems should be central to meeting the objectives of the protection of life, buildings and contents.

(b) Appropriate to risk: Any system that is installed should be appropriate to the risks being considered.

(c) Compliant with legislation: Systems should be installed according to demonstrable performance-based and other legislatively prescribed standards of safety.

(d) Minimally invasive: The retrospective fitting of fire systems should involve minimal degrees of physical intervention on the historic structure.

(e) Sensitively integrated: Installed systems should be designed to be integrated sympathetically with the historic fabric and its detail.

(f) Reversible: Fire systems should be installed according to a reversible, 'plug-in, plug-out' installation philosophy so that if a feature is removed then the listed aspect of the building remains perfectly intact as it was before.

8.3 Detection and warning systems are an effective fire safety measures for heritage buildings and museums. They can be installed to provide property protection or for life safety, both of which should be installed to comply with latest edition of British Standard 5839 part 1 or part 6.

8.4 When installing a detection and warning system in a historic building the aim should be to install minimum invasive devices. There are several types of systems available on the market but examples of systems that have been sympathetically installed in historic buildings include:

(a) Aspirating smoke detectors offer potential for minimum invasion and reversible installation in sensitive environments. Aspirating smoke detectors have a low probability of false alarms. This is due to an integrating effect: small samples of low density smoke in several sampling points will raise an alarm, while quite dense smoke in one sampling point only will not.

(b) Wireless point detectors can offer high reliability and are unobtrusive.

(c) Visual and thermal image fire detectors (camera software fire detection) may be used in large indoor spaces from well hidden locations. The visual category is prone to deception by moving objects and shadows. Thermal ones discriminate any movements or shade and detect fire by temperatures exceeding set limits.

(d) Beam smoke detectors can be used in large rooms with ornate ceilings.

8.5 The ideal position for detectors is as detailed in the British Standard, as central as possible. To satisfy aesthetics they are often placed close to the wall above the door, so that they cannot be seen when entering the room. Smoke testing in a variety of premises has shown that natural air currents influence the movement of smoke, in the early stages of a fire, as much as the convection currents set up by the fire. Doorways and windows often provide these air currents which very effectively keep the smoke away from the detectors, rendering them useless. Detectors that are recessed, or placed above holes in the ceilings, or hidden behind beams and lights are also ineffective.

8.6 Measures should be undertaken to decrease the probability of false alarms while retaining response sensitivity to real fires. There should also be some consideration with regard to the transferring of the call from an automatic signal to a call centre. Fire Rescue Services will attend all calls to fires but consideration must be given to the frequency of false alarm instances and whether it is appropriate to introduce filtering practices to prevent false alarms from being transmitted to the emergency services. Frequent false alarms are an indication of failures in fire safety management which may result in enforcement action by the relevant FRS and/or incur a charge from the FRS who are now entitled to recover some attendance costs.

8.7 Emergency lighting and emergency escape lighting conforming to BS5266-1 should be provided in those buildings where there is no natural light or where they are used in the hours of darkness. These lights are normally powered by battery packs and only illuminate upon mains or local lighting sub-circuit failure.

8.8 Fire exit signage should be provided with pictograms. They should be large enough to be clearly seen from the furthest viewing distances. The signs should be in the colours detailed in the 'The Health and Safety (Safety Signs and Signals) Regulations 1996'. They are best sited above the exit doors, but could be hung by chains from the ceiling or brackets where they would spoil ornate architraves. Signs that meet the criteria in BS 5499 and BS EN 7010 also meet the standard of the Regulations and can be used.

8.9 Notices detailing the actions to be taken in case of fire should be provided adjacent to the fire alarm break-glass call points.

8.10 Blue disc signs stating 'Fire door keep shut' should be affixed to self-closing doors. Where there are particularly ornate doors, these notices may be fitted to the leading edge and in the frame of the door, where they will only be seen when the door is open. Notices stating "Fire door keep locked shut" are affixed to doors such as cupboards or boiler rooms, which are fitted with locks rather than self-closing devices. Doors fitted with automatic closing devices will have the notice "Automatic fire door keep clear"

8.11 The type of extinguisher provided should reflect the potential fire risk for each area. Training in the use of fire fighting equipment should be given to all staff who are expected to use it. This could include 10 year service free extinguishers. It is sometimes inappropriate to fit fire extinguishers and their associated backets to some walls, especially where the wall has historical value or protection. Therefore it is recommended that an appointed competent person should liaise with the fire extinguisher technicians when installing fire extinguishers to make sure they are still fitted in the appropriate areas but do not compromise or damage walls.

8.12 Adequate and appropriate maintenance of all fire protection systems and facilities is of the utmost importance as all of these requirements should be available and in good condition at all times. Failure to do so will not only endanger a building and its occupants and place firefighters lives at risk, but could also render the RP liable to prosecution.

8.13 Depending on the risks and hazards identified within the fire risk assessment, the findings may determine that a sprinkler/water mist system is required within the premises in order to remove/reduce the risk/hazard to an acceptable level. Where a bespoke suppression system has been installed, this should be fully accounted for within the fire risk assessment.

8.14 Where appropriate, the LFB fully supports the use of Automatic Fire Suppression Systems (AFSS) to protect property and to reduce fire deaths and injuries. The LFB Sprinkler Position Statement is available on the London Fire Brigade website.

9 Salvage/Damage Control Plan

9.1 The next section of the Fire Safety Manual should consider Salvage/Damage Control. Any collections or artefacts should be subject to a suitable Salvage/Damage Control Plan to ensure that they survive any fire or other incident and should take into account, out of hours incidents where a responsible/competent person may not be on site.

9.2 The procedures for salvage will vary according to the scale of the incident, but it is a worthwhile exercise to plan for the worst case scenario i.e. the removal of all the objects. Damage control is also a key factor which should be fully considered. For example, there may be a ceiling artwork or section of the building that, wherever possible, cannot be damaged by fire, smoke or water.

9.3 Each organisation is individually responsible for making adequate provisions for the salvage, recovery and protection of the artefacts and collections under their care.

9.4 Individual organisations may want to consider developing a Memorandum of Understanding (MOU) with other organisations with regards to cooperation on issues relating to emergency salvage, recovery and the protection of assets.

9.5 A Salvage Plan should identify the following points:

(a) The Salvage Incident Co-ordinator and their deputy.

(b) Contacts list.

(c) Training of the salvage teams.

(d) Site and building plans.

(e) Salvage priorities (snatch list).

(f) Salvage procedures.

(g) Emergency first aid conservation, including suitable containers/covers for key items, which allow responders to minimise the risk of damage during salvage operations.

9.6 If the risk to life due to the severity of the emergency is considered too great then the FRS will take the decision that the building is unsafe to enter. Until the emergency is under control, that decision will stand and no one will be allowed to enter the building.

9.7 Consideration should be given to the time before trained site staff arrive e.g. 30-60 minutes plus, when fire crews need a clear and simple guide that prioritises according to risk (to the valuable items/building).

9.8 The local Salvage Incident Coordinator will take the lead for their organisation and advise both the FRS Sector Commander responsible for salvage and their own salvage team members. He/she should be easily identifiable ideally by wearing a tabard or similar, and should be able to interpret the salvage plan to hand as well as give advice regarding any resources required to move priority objects to safety. Once on site it is imperative that they make themselves known to the Incident Commander and do not independently commence a salvage plan.

9.9 When a disaster occurs it may be necessary for the first member of staff on site to contact other members of staff in order to help with the many tasks that need to be performed. The initial stages of an incident are of great importance when attempting to organise a salvage operation, therefore the knowledge of the member of staff first on site could be invaluable. Consequently, if they are attempting to contacting members of staff whilst liaising with the fire service they will soon be overloaded. With this in mind full consideration should be given by the responsible person as to how members of staff are going to be contacted quickly without delaying the salvage of items. An alternative solution is to contract the task out to a third party, such as a call receiving centre.

9.10 One of the most difficult items in the plan to keep up to date is the contact lists, both for management teams, members of salvage teams and equipment suppliers. With staff movement and turnover it can be difficult to make sure the list is current at all times. If it was decided to employ a contacts centre then part of the contract would involve the third party periodically checking the lists and making test calls.

9.11 Training of the salvage teams should include practical aspects such as reading plans, identifying objects on the salvage list, removing paintings from their fixings, object handling and first aid treatment of damaged objects. All these should be practiced in simulated conditions and the practices should periodically include joint exercises with the FRS.

9.12 Salvage lists ideally include photographs of the items to be rescued, their position in the room and building and any special measures needed to remove them. This can include manual handling requirements and removal techniques. If a room is completely filled with items of similar value, it is still worth sorting them into an order of removal. This could be by order of rarity, importance, ownership, or ease of removal rather than simply giving them all a priority 1 rating. The procedures for salvage will vary according to the scale of the incident, but it makes sense to plan for the worst case scenario and for removal of all the objects.

9.13 It is recommended that copies of the building plans are made available to fire service personnel. All plans should clearly identify the layout of the premises and the location of the items needing salvaging.

9.14 Ideally there should be a picture(s) of the item(s) that needs to be salvaged, as a minimum there should be a description of the item, including the height, weight, fixing method, number of people required to move it, or what measures are required to protect it in situ.

9.15 There should be a clear indication of exactly how these items should be removed from their location. Considerations include:

(a) Where items are stored in cases, there should be clear instructions how the case can be opened.

(b) Can painting be removed off site in their frames? Does the picture need to be cut from the frame? How should the picture be rolled to minimise the damage to it?

(c) How many people are required to lift/remove an item or will it require specialist equipment?

(d) Do certain items require bespoke cases/containers for safe removal and if so, can they be clearly identified and located in an emergency?

9.16 Once the item has been identified and is ready to be removed from the building the next aspect is to consider how the item will be transported from the building to a safe area to store objects. This is particularly key for smaller objects which could be difficult to identify and remove safely. Consideration should be given as to whether a bag or carry case etc. would be appropriate. Ideally if a bag or carry case etc. is considered acceptable, then thought should be given to ways to reduce any potential water and smoke damage once the items are in the bag. In order to avoid any damage whilst the item is being transported it may be appropriate to consider a padded bag or other solution.

9.17 Once out of the building with a salvaged item, the local firefighters will report to the Entry Control Officer/ Salvage Commander. If the firefighters are in Breathing Apparatus (BA) they will be unable to go past this point to deliver the salvaged item to the safe area. At this point the Salvage officer from the premises will need to have a system ready to transport the salvaged items to the interim safe areas to store objects.

9.18 It may initially not be possible to get the salvaged items to a permanent store where they will stay in the longer term. It is advisable to consider where an appropriate interim safe area would be in relation to your premises. The incident commander may give the final agreement as to where the location will be but ideas will be welcomed. It would be prudent to consider the weather conditions when considering the location of this interim safe area.

9.19 The first few hours after a disaster are critical to the long term survival of fragile historic artefacts. If the condition of the objects can be stabilised as soon as possible the long term damage by

mildew or rot can be avoided. The salvage plan should include the provision of first aid equipment and a suitable place, either permanent or temporary for treatment.

9.20 It is recommended that salvage teams are provided with personal protective equipment, which includes identification, hard hats, fluorescent vests, steel toed boots/shoes and torches.

9.21 Learning from experience is a very useful tool. All incidents should be reported to management so that a record can be made of their nature, size and potential threat. These reports can then be used to take action before the incident is repeated.

9.22 The probability of arson attacks can be reduced with good security measures, but the difficulties of removing secure objects during salvage operations need consideration. In addition the movement and storage of valuables after removal requires a degree of pre-planning. The security of the salvage priority list and the information it contains should also be considered because it needs to be accessible in emergencies.

10 Working with Fire and Rescue Services

10.1 Wherever possible the FRS will attempt to facilitate salvage/damage control as a high priority providing crews of firefighters, who will endeavour to remove artefacts /collections from areas unsafe for salvage teams to access. Similarly the FRS can work in support of the salvage team when they have been authorised by the Incident Commander to operate inside the premises.

10.2 To facilitate this, consideration needs to be given to providing simple Aide-memoires for the FRS, to include; The Salvage Sector Commander and the Incident Commander. These should give an overview of your operational procedures and key objectives in terms of salvage.

10.3 In complex buildings, there may be a requirement for layout plans to be made available for firefighters or information on the presence of particular hazards. See London Fire Brigade Guidance Note 70 - Premises Information Box.

10.4 In the event of a fire, the FRS Incident Commander will have to decide on the operational tactics to be employed and quickly develop a plan for dealing with the incident. It is recommended that the responsible person for the historic building establishes a relationship with their local FRS to ensure that planning and potential exercises can be carried out to ensure more effective response in case of an incident. The following sections identify some of the likely operational considerations that should be considered as part of a plan.

10.5 The extent and value of the damage limitation team's training will influence the confidence which the incident commander will have in it. This will directly affect the extent to which he will allow use to be made of the team. Teams which have been properly trained and are accustomed to working alongside firefighters and complying with their instructions will be much more effective than those which have not been trained.

10.6 Hazards to firefighters: Although the hazards implicit in fighting fires in traditional buildings are little different from the hazards found in 'normal' firefighting, there may be additional risks to fire crews and others resulting from the types of materials stored or used in these premises. For example, it would be likely to encounter a wide range of hazardous chemicals in buildings used for the storage, display or preparation of natural history collections.

10.7 FRS try to cause as little water damage as possible when fighting fires, but at serious high level incidents the water from their hoses may leak into the rooms below. The weight of water may well cause structural damage and will certainly cause debris to cascade onto lower floors. It may be possible to cover objects to minimise water damage, but the best course of action would be to

divert as much as possible to the outside, using waterproof sheets and hoppers if available. Removal of objects before the water reaches them is another option, but relies on there being enough people and time to remove them safely. Collections of books are a particular problem because of the number and weight of them. If the collection is on upper floors a book chute may be required to get them to ground level quickly.

10.8 All activity aimed at minimising the impact of a fire on people or property is recommended to include regular and effective contact with the local FRS. In the case of larger properties or sites, an invitation should be extended to the local fire station to visit the premises and gain valuable knowledge of the building, its uses and any special factors which might affect the safety of the occupants or the way in which the fire might have to be fought. Table top exercises can also take place.

10.9 The following factors should be taken into account:

(a) Location of the building and signpost information — for example, is the building called one thing by the occupants but known as something different locally

(b) Access to the building: special problems with bridges, roadways and gates any of which might prevent the speedy arrival of fire appliances e.g. weight and width restrictions

(c) Entry to the building - may not always be at the front, possibly a rear service courtyard

(d) Water supplies — apart from hydrants where are there additional sources of firefighting water? Are open water sources such as rivers or ponds/lakes accessible?

(e) The activities undertaken — what is the building used for?

(f) Are the occupants likely to have problems evacuating themselves?

(g) The presence of flammable liquids, explosives, compressed gases or radioactive substances

(h) Locations of water stopcocks, meter bypasses, electrical substations, transformers and switchgear, gas shut-offs and the like.

(i) Particular hazards in the construction features of the building (including asbestos);

(j) The use of combustible under floor insulation;

(k) Underground vaults ducts and voids where fire may spread unchecked;

(l) Worn stone slabs in stairway construction; and

(m) The presence of cast iron columns and wrought iron beams.

10.10 Regular contact can be developed and other activities organised. For example, arranging for the attendance of fire appliances at a drill or exercise will benefit all parties and will ensure that crews from the local fire station are able to familiarise themselves with the site. Meetings should be held to ensure that the fire personnel are aware of forthcoming special activities such as major exhibitions and special functions, or of temporary changes in building layouts.

10.11 This is particularly important where buildings may only have a narrow frontage and no side or rear access. Pedestrianisation and narrow streets may also restrict or slow down fire service activities. Access for fire appliances is often provided to pedestrianised areas, but may become more difficult with the provision of street furniture, siting of street traders and the growth of trees. Remote rural locations with no road access will also make access difficult or impossible.

10.12 Where there are significant changes, for example if an access drive is temporarily closed or if there is a long term presence of contractors on a site, the local FRS should be informed immediately. They should also be informed if the detection and warning system or any firefighting equipment such as a fire suppression system is taken out of action for more than an hour or so.

11 Business Continuity

11.1 Business Continuity Management is planning for and managing the unexpected including a fire or flood. A Business Continuity Plan is a management tool specific to your business and designed to help your business survive in the event of any severe disruption that prevents or restricts your business operating from your premises in both the short and long term.

11.2 You need to consider not only loss of stock, equipment and premises but also loss of income. It is surprising how long it can take to fully recover, in some cases up to 2 years or more. An insurance company could be reluctant to pay out on a claim if appropriate fire safety measures have not been implemented and/or managed correctly.

11.3 Make a list of everything in your plan that is critical to the running of your business and without which your business would be disrupted. The next step is to think of ways of how you could overcome the problem and write them into your plan.

11.4 All IT based records should be backed up regularly and recorded to another location or onto a disc and taken home. If your business operates using books then the books should be taken home at night and kept in a secure metal box or similar to protect them from fire.

11.5 Informing your customers is also important especially where they have left goods for service or repair with you. When you take in goods from customers make sure you take a telephone number to enable you to contact them.

11.6 Having developed your plan keep it alive by ensuring your, managers are aware of the arrangements contained in your plan and by ensuring the procedures you have developed are carried out by appropriate staff. Keep the plans under regular review - place a note in your diary every 3 months to remind yourself to check them. It is recommended to test your plan annually.

11.7 The Local Authority Civil Contingency Planning Team can provide advice and guidance to help you develop your plan but they cannot write your plan for you.

11.8 Templates to assist with writing your business continuity plan can be found on the London Prepared website: www.londonprepared.gov.uk.

12 Bibliography

Detailed guidance on the various standards referred to in this guidance note may be obtained from the following publications.

AVAILABLE FROM	TITLE
British Standards Institution (Sales) 389 Chiswick High Road London W4 4AL Telephone: 020 7996 9000 Fax: 020 7996 7001 E-mail: cservices@bsi-global.com Web : www.bsi-global.com	BS 5839-1: Fire detection and fire alarm systems for buildings. Code of practice for system design, installation, commissioning and maintenance BS 5839–6: Fire detection and fire alarm systems for buildings. Code of practice for the design, installation, commissioning and maintenance of fire detection and fire alarm systems in domestic premises BS 5266-1:Emergency lighting. Code of practice for the emergency lighting of premises BS 5306-3: Fire extinguishing installations and equipment on premises. Commissioning and maintenance of portable fire extinguishers. Code of practice BS 1869: Fire Blankets BS 8214: Timber-based fire door assemblies. Code of practice BS 476-22: Fire tests on building materials and structures. Method for determination of the fire resistance of non-loadbearing elements of construction BS 476-31.1: Fire tests on building materials and structures. Methods for measuring smoke penetration through doorsets and shutter assemblies. Method of measurement under ambient temperature conditions BS EN 1634-1 Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware. Fire resistance test for door and shutter assemblies and openable windows BS 7974-all relevant parts: Application of fire safety engineering principles to the design of buildings. BS 8300-1: Design of an accessible and inclusive built environment. External environment. Code of practice BS 8300-2: Design of an accessible and inclusive built environment. Buildings. Code of practice

The Stationery Office (Counter Service) 123 Kingsway London WC2B 6PQ Telephone: 020 7242 6393 Fax: 020 7242 6394 Web: www.tso.co.uk ALSO: The Stationery Office (Mail, Telephone & Fax Orders) PO Box 29 Norwich NR3 1GN Telephone: 0870 600 5522 Fax orders: 0870 600 5533	Building Regulations Approved Document B Approved Document M Furniture and Furnishings (Fire) (Safety) Regulations Regulatory Reform(Fire Safety) Order 2005 S.I.1541 TR/19 HVCA Guide to Good Practice Internal Cleanliness of Ventilation Systems

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