

FIRE SAFETY GUIDE TO HOT WORKS WITHIN HISTORIC AND LISTED BUILDINGS



This document is designed to assist NFU Mutual customers in managing the fire risks associated with hot works completed in historic and listed buildings



NFU Mutual
RISK MANAGEMENT SERVICES

INTRODUCTION

A common cause of fires in historic buildings is via contractor and private hot works. Such works often occur during large scale restorations or refurbishments where lead work is being replaced and/or repaired, extensive plumbing works are being undertaken but can as easily be employed for smaller or localised repairs such as paint removal using heat guns. As such, all hot works require extreme care to prevent fire inception.

The safest approach is to prevent any hot works from occurring within or in proximity to the building, however this may not be possible, or practical, and may prove a necessity where there is no alternative.

Hot works are a concern across all building types, however historic properties provide additional challenges in the form of:

1. Known or hidden wall and floor voids with absent fire stopping;
2. Waste matter accumulations in such voids and cavities and in general to rooms rarely used;
3. The increased presence of timber in the form of framing, paneling and flooring and;
4. Dry construction matter with applied combustible paint, lacquer, varnish or wax finishes.

The design of the building may provide un-compartmented areas which can allow fire to propagate and spread unchecked through the structure and will permit smoke to travel and cause additional damage to delicate and historic finishings. For more remotely located properties, delayed Fire & Rescue Service attendance times and access to usable water supplies can allow a fire time to take hold.

Attempts to extinguish a fire will also result in extensive water damage and whilst elements can be replicated, the original historic detail will, in some cases, be lost forever.

This safety guide is intended for owners, occupiers and managers of historic/listed buildings and their appointed contractors and is designed to promote best practice when undertaking work involving the application of heat. It has been extended to cover additional potential ignition sources that could occur in historic properties including open fires and period demonstrations for events etc.

FIRE RISK ASSESSMENT

For commercially occupied properties, legislation requires a fire risk assessment to be carried out by a responsible person (the employer or persons in control). All owners and operators that carry out hot work must ensure these activities have been adequately covered by their fire risk assessment. Generic fire risk assessments should not be used in historic buildings and any assessments must be tailored to the historic building in question

and include all relevant details when considering how to safely undertake the hot works.

The assessment must be carried out by a 'competent person'. This person has to possess sufficient technical knowledge, training and practical experience of hot work processes and associated hazards.

HOT WORK

Hot works in historic properties generally occur as part of larger contract works including roof replacement or repairs, pipework and plumbing extensions or modernisation and can include lead forming, copper pipe brazing and soldering and for smaller works including redecorating and using hot air guns to remove paint layers. The list is not exhaustive and hot works should be considered to include to any equipment producing heat or naked flames. The scope of the best practice can be extended to the lighting fires in hearths and the use of candles.

As a general rule, no hot work to be permitted in any historic building and the increased

costs for using alternative ‘cold fix’ methods to not be a deciding factor in the granting of a Hot Work Permit. In addition, carrying out hot works within a designated, detached workshop located at least 7 metres from the historic/listed building to be encouraged wherever possible.

However, when there is no alternative, a Hot Work Permit system which details the precautions to be taken prior to, during and upon completion of hot work activity to reduce the potential for associated fire damage.

GENERAL CONSIDERATIONS

1. Hot work to only be undertaken by competent and trained personnel and where there is not a safer alternative method of work.
2. If contractors are engaged to undertake hot work, only competent contractors suitably experienced in hot work to be used and proof of Public Liability insurance with an indemnity limit of at least £5 million to be obtained prior to works commencing.
3. Any person/persons undertaking hot works to be made aware of the fire safety procedures at the property and give a written undertaking to comply with them.
4. The hot work equipment is of proprietary manufacture operated by a competent employee or contractor and is:
 - i. Maintained and serviced in accordance with the manufacturer’s instructions, where owned by you;
 - ii. Attended at all times while alight or in operating mode; and
 - iii. Extinguished immediately after use;
5. Where an alternative method of work is not possible hot work to be transferred to a safer location e.g. contractor’s own premises, dedicated workshop or open yard, to reduce the risk of fire within the property.
6. Cold cutting to be used for water tank removal rather than the use of heat and push fit fixings to be considered for plumbing solutions to avoid soldering or brazing.
7. Paint layer removal should be completed by hand or using non heat generating tools only
8. If the property is protected by an automatic fire alarm system, any deactivation of heat or smoke detectors to be strictly limited to the work area, and for the duration of the works only. This will minimise the risk of false alarms occurring but ensure the detection is in full operation after the works have been completed. If the works are to be conducted in phases, the fire detection to be fully operational during those interim periods.

9. Where there is a high risk of fire the work to be undertaken only when sufficient time is available to undertake appropriate fire watch procedures. Hot works undertaken outside of normal hours are not recommended for accommodation risks in residence.
10. The use of gas cylinders of any type within historic properties should be carefully

assessed and cylinders to be housed in a locked cage sited external to the property. The gas supply to be piped into the building by an approved system and any supply connections are to be undertaken solely by a qualified person. Gas cylinders must be secured in an upright position and hose lengths kept to a minimum.

PRIOR TO HOT WORK COMMENCING

In addition to the Hot Work Permit system outlined above and the contractor controls recommended:

1. A suitable competent person to be made responsible for fire safety.
2. A trained person not directly involved with the work will provide a continuous fire watch during the period of hot work.
3. An area of at least 10m around the work to be cleared of combustible materials and flammable liquids or gases. Where combustible materials cannot be removed, they together with any openings or gaps in walls, floors and ceilings within 10m, to be protected by non-combustible blankets, screens or drapes. Care should be taken to ensure wall and floor voids are clear of waste matter as this can often be a source of fire propagation.
4. All floors to be swept clean and combustible floors in the area to be covered with overlapping sheets of non-combustible material or wetted and liberally covered with sand but in consideration of any historic flooring materials present and all floors are to be swept clean.
5. If work is to be undertaken on one side of a wall or partition the area on the other side to be examined to ensure that any combustible materials are not in danger of ignition by direct or conducted heat. Particular care should be taken regarding any period surfaces that might have had flammable polishes or finishes applied.
6. If hot work is undertaken on plant such as boilers, hydraulic lift equipment etc. it is to be purged of hazardous substances e.g. flammable liquids/vapours.
7. At least two suitable fire extinguishers to be made available for immediate use. Regular inspection and maintenance to be undertaken and recorded by an approved supplier. Staff to be provided with instruction and training in the correct use of extinguishers and contractors to confirm fire extinguisher training has been provided.
8. All personnel involved with the hot work to be familiar with escape routes from the premises and the method of raising the fire alarm.

9. All hot work equipment to be used in accordance with manufacturer's instructions, attended at all times when alight or in operating mode. The heat application tools and equipment should be lit as late as possible and extinguished immediately after use and preferably removed from the premises if the tool surfaces remain hot.
10. During the work fire alarm detection devices may need to be isolated to prevent false activations. Only individual detectors in the vicinity of the work to be isolated. Any activation of detectors out of these areas suggests smoke may have spread beyond the area anticipated by the risk assessment. This suggests possible concealed fire or smoke spread and will require immediate investigation.

FOLLOWING COMPLETION OF THE WORK

Once the approved hot works have been undertaken, the following measures should be practiced:

1. The area to be cleared of any hot waste materials or spent materials generated by the process.
2. All equipment, including gas cylinders, to be removed from the site or returned to a designated safe store.
3. The site to be monitored by a trained competent person for at least 60 minutes after completion of the work to detect and extinguish any smouldering materials or address any hot spots. It is strongly recommended this is followed by further checks being made at regular intervals, of no more than 20 minutes, up to 120 minutes after cessation of hot work, before the Permit is signed off. The fire watch period to be extended where determined necessary by fire risk assessment. The inspections to embrace the floors below and above and areas on the other side of walls or partitions as appropriate.
4. We recommend the area immediately within the vicinity of the work be inspected using a thermographic imaging camera to ascertain if there are any hot spots present post works.
5. Any sections of the fire alarm and other active fire protection measures that have been isolated for the period of the work Permit, or smoke detectors covered over, to be fully reinstated on completion of the works.

HOT WORK PERMITS

Where hot work is undertaken in any area other than designated workshops, whether by employees or contractors, a Hot Work Permit to be in place.

1. A Hot Work Permit is a formal written statement that all foreseeable fire related hazards have been documented and relative precautions defined. It does not in itself make the task safe but relies on conscientious implementation by specified personnel to adequately control the risks.
2. The person/persons authorising the hot work to have competency/training of the associated activity and risks, and have appropriate authority, to ensure compliance with the procedures. Consideration to be given to those involved in the management of hot works obtaining the Fire Protection Association (FPA) Hot Work Passport qualification to demonstrate competency.
3. Prior to hot work being undertaken the person authorising it to issue a Permit detailing the exact nature and location of the work, the period for which it is valid, the risk controls to be complied with and the inspection upon completion of the work.
4. Hot Work Permits to be issued only by the person/persons authorised to do so. The requirements stated in the Permit to be complied with before the Permit is issued, and the work covered by the Permit to not be extended to cover unauthorised works.
5. Permits to be issued in duplicate with the top copy being given to the person undertaking the work and the second copy retained by the person authorising it.
6. General open-ended Hot Work Permits not to be permitted under any circumstances and to be task specific for the purpose of the contract works only.
7. Unscheduled spot-checks to be made of the work during progress to ensure compliance with the Permit.
8. On completion of the hot works, the person undertaking it to complete and return the Permit with the authorising person to check the work has been undertaken correctly and all personnel and equipment have been removed from the area.
9. Consideration to be given to taking photographs to prove that the hot work is complete and, where appropriate, thermal imaging equipment used to check that there are no incipient hot points.
10. Where the property is operated as a business rather than a domestic residence, the Hot Work Permit system to be monitored, reviewed and, where necessary, amended on an ongoing basis to ensure it fully meets the business's needs.

NAKED FLAMES – NON HOT WORKS

Other sources of naked flame can be expected to be present within historic buildings including open fires and the use of candles for visitors and events. Lit fires in kitchens and drawing rooms enhance the visitor experience in historic buildings open to the public and candles can be a requirement for weddings and functions. Although fires and candles are not hot work in the usual sense, they are naked flames and therefore such activities could require a Permit to Work to ensure the fires and candles are safely managed. A Permit to Work system can be set up for the duration of the events or for the whole year if a regular occurrence, providing regular inspections and checks of the hearth and flue and suitably supervised as part of a general method statement or premises risk assessment.

In respect of the use of open fires, suitable risk control measures should include:

1. Chain curtains or fire guards being used when the fire is lit;

2. Only seasoned woods burnt to reduce the risk of ejected matter and
3. The flues to be inspected and professionally swept on at least an annual basis to ensure the flue is clear and soot accumulations duly removed.

With regard to the use of candles during events:

1. Storm jars should be used to ensure the candles are encased;
2. Candles should be supervised at all times when lit and extinguished at the close of the event.
3. Tea lights must be used within non combustible containers and must not be placed directly on any other surface.

FURTHER GUIDANCE

[RISC Authority](#) are a funded research scheme supported by a significant group of UK insurers and conducts research in support of the developments and dissemination of best practice on the protection of property and business. Guidance document - RC7 Risk Control Recommendations for Hot Work, and the Joint Code of Practice on the Protection from Fire of Construction Sites is available at www.riscauthority.co.uk

Fire Protection Association - Fire Risk Management in Heritage Properties

Managing Fire Safety in Historical Buildings
CFPA-E Guideline No 30:2013 F

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

HOT WORK PERMIT CHECKLIST

The following checks to be carried out prior to commencing hot work. The person carrying out these checks to consider each of the following statements. The box alongside each statement needs to contain a 'Yes' or to be left blank (if the matter is not relevant) if a Hot Work Permit is to be issued. A 'No' may result in refusal of a Permit.

This Checklist Relates to Permit Number: _____

GENERAL

Wherever practicable the use of Hot Work to be avoided and a safer alternative undertaken.

If you cannot comply with the following points, do not go ahead with the Hot Work.

FIRE PROTECTION

YES NO

Where an automatic fire detection system has been installed, it will be kept operative. Only the zone where hot work is being carried out will be isolated for the period whilst the hot work is in progress.

A trained person, not directly involved with the work, will provide a continuous fire watch during the period of hot work.

Following completion of each period of the work, the fire watch will continue for at least 60 minutes, with further checks at regular intervals, of no more than 20 minutes, up to 120 minutes after the cessation of hot work, before the Permit is signed off. This is to ensure the working area and all adjacent areas, including the floors below and above, any proximate voids and areas on the other sides of walls, screens and partitions and above false ceilings are free of smouldering materials and flames.

At least two suitable 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 & Rescue Service.

PRECAUTIONS WITHIN 10 METRES (MINIMUM) OF THE WORK

YES NO

Combustible materials have been cleared from the area. Where materials cannot be removed, or where combustible finishes are present, protection has been provided by non-combustible or purpose-made blankets, drapes or screens. Where accessible, floor and wall voids have been cleared of any combustible matter.

Flammable liquids and/or cylinders 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 (combustible floors or otherwise) are adequately covered.

Protection (non-combustible or purpose-made blankets, drapes or screens) has been provided for:

- i. walls, partitions and ceilings of combustible construction or surface finish
- ii. all holes and other openings in walls, partitions and ceilings through which sparks could pass.

Where hot work is intended to be undertaken on buildings containing timber framed construction or a high percentage of combustible construction, alternative methods have been considered where possible.

Where work is to be undertaken on one side of a wall or partition the area on the other side has been examined to ensure that any combustible materials are not in danger of ignition by direct or conducted heat.

Combustible materials have been moved away from the far side of walls, partitions or from within any voids including panelling where heat could be conducted

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.

EQUIPMENT

YES NO

Equipment for Hot Work has been checked and found to be in good repair.

Gas cylinders have been properly secured.

HOT WORK PERMIT

A copy of the completed Permit should be retained for auditing purposes.

Issuing Company: _____ Permit Number: _____

(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 undertaken.

Signed: _____ Block capitals: _____

Date: _____ Position: _____

Contractor Company (where applicable) _____

AGREEMENT

To be completed by the 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 attached checklist have been complied with. I have carried out a risk assessment and consider that there is no reasonably practical alternative to doing this job using Hot Work. I have been provided with evidence of appropriate Public Liability Insurance.

Signed: _____ Block capitals: _____

Date: _____ Position: _____

Contractor Company (where applicable) _____

FOLLOWING COMPLETION OF WORK

(To be completed by member of staff or contractor responsible for the work. The Permit to then be returned to the Issuer)

YES NO

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.

Paint strippings, stub ends of welding rods and other hot waste materials have been removed and disposed of safely.

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

Time inspection completed (This must be at least 60 minutes after work was completed, followed by further checks being made at regular intervals, of no more than 20 minutes, up to 120 minutes after cessation of hot work).

Signed: _____ Name of Signatory in block capitals: _____

Date: _____ Position: _____

Contractor Company (where applicable) _____

SIGN OFF BY ISSUER OF PERMIT

The Hot Work has been completed. Any zone of the fire alarm system or other fire protection system that was isolated has been fully reinstated.

Signed: _____ Name of Signatory in block capitals: _____

Date: _____ Position: _____

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