
HOT WORK PERMIT OPERATIONS

Authority

In recognition of the inherent hazards posed by certain hot work processes, the National Fire Protection Agency adopted Standard 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*. The United States Occupational Safety and Health Administration (OSHA) incorporated NFPA 51B by reference at 29 CFR 1910.252.

Purpose

The purpose of this SOP is to summarize regulatory requirements. Individual departments may adapt this SOP to meet their unique needs, to the extent that regulatory requirements are met or deviations are acceptable to the Authority Having Jurisdiction (AHJ). At UNL, the AHJ is the University Code Official (Facilities Planning and Construction, Building & Fire Safety). The University Code Official has been delegated authority by the State Fire Marshall and is responsible for overseeing and enforcing compliance with fire and life safety codes at UNL.

Scope

“Hot work” means processes involving burning, welding, or similar operations that are capable of initiating fires or explosions through spark, flame, or heat, such as:

- Welding and allied processes (e.g., oxy-fuel gas welding, open-flame soldering, brazing, thermal spraying, oxygen cutting, arc cutting)
- Heat treating
- Grinding
- Thawing pipe
- Powder-driven fasteners
- Hot riveting
- Torch-applied roofing (in conjunction with the requirements of NFPA 241, Standard for Safe Guarding Construction, Alteration, and Demolition Operations)

“Hot work” does not include:

- Candles
- Pyrotechnics or special effects (UNL’s AHJ has a separate permit process for these activities)
- Cooking operations
- Electric soldering irons
- Design and installation of gas cutting equipment and welding equipment covered in NFPA 51, Standard for the Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting, and Allied Processes

- Additional requirements for hot work operations in confined spaces
- Lockout/tagout procedures during hot work.

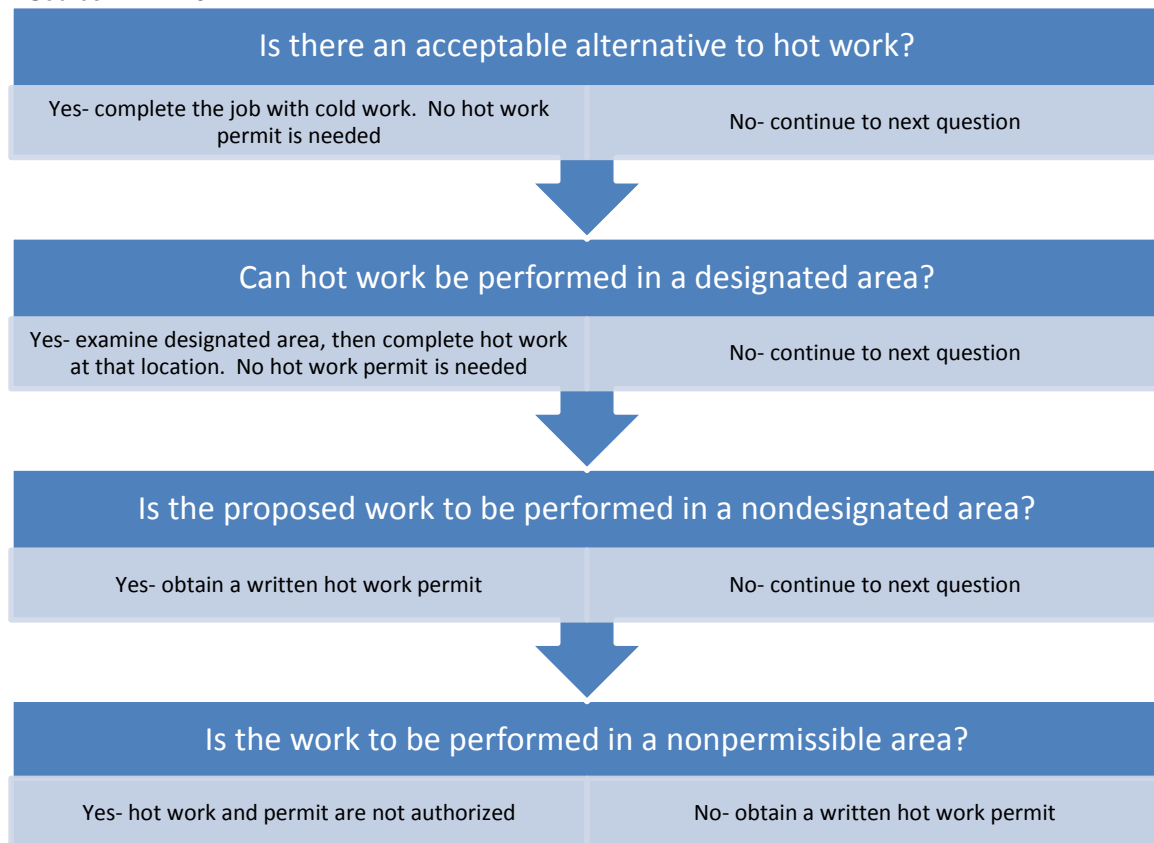
Applicability

This SOP applies to all UNL personnel conducting hot work on University owned or leased property, whether indoors or outdoors, in areas that have not been permanently established, designated, and maintained for this type of work. Contractors acting on behalf of UNL must adhere to an effective and compliant hot work permit system. This SOP is intended to summarize the requirements for conduct of hot work. It is not inclusive of every aspect of NFPA 51B. Persons involved with hot work processes must consult and adhere to all aspects of NFPA 51B.

Conditions Requiring a Hot Work Permit

When work is conducted outside of a permanently established area that is designated and maintained for this type of work, a hot work permit may be required, as depicted in the following decision tree.

* Source: NFPA 51B



Designation of a Permit Authorizing Individual (PAI)

Assuming a hot work permit is required, it must be issued by a “Permit Authorizing Individual (PAI).” It is the responsibility of the department employing and supervising the hot work operator to designate a PAI. In general, the PAI may not be the same

person as the hot work operator. Persons designated as a PAI must meet the following qualifications:

- Aware of the hazards posed by the hot work process;
- Familiar with applicable regulations.

Pre-Operational Review by PAI

Prior to conducting hot work requiring a permit, the PAI must determine the type of hot work operation to be conducted, the identity of the hot work operator, completion of pre-operational fire safe precautions, and determine whether a fire watch is required. Pre-operational fire safe precautions include verification of:

- Available sprinklers, hose streams, extinguishers, and smoke/heat detectors are present and in service/operable, including an appropriately classed portable fire extinguisher.
- Hot Work equipment is in good repair.
- Persons conducting hot work shall don appropriate personal protective equipment, to include clothing that minimizes potential for ignition, burning, trapping of hot sparks, and electric shock.
- Floors are swept clean of combustibles within 35' of the hot work.
- Combustibles within 35' of the hot work have been removed or protected by listed welding curtains, blankets, pads, or equivalent. When fire curtains are used, they shall be tight to the floor to prevent escape of errant sparks.
- Flammable liquids, dust, lint, and oil deposits have been removed within 35' of the hot work.
- Explosive atmospheres have been eliminated within 35' of the hot work (including scheduling of other processes that could introduce an explosive atmosphere during the hot work period).
- Combustible floors have been wetted down, covered with damp sand, or listed welding blanket or pad, as appropriate, and within 35' of the hot work. Where floors have been wetted down, personnel operating arc welding or cutting equipment shall be protected from possible shock.
- All wall and floor openings have been covered within 35' of the hot work.
- If hot work is done near walls, partitions, ceilings, or roofs of combustible construction, they shall be protected by listed welding curtains, blankets, pads, or equivalent.
- Hot work shall not be attempted on a partition, wall, ceiling, or roof that has combustible covering or insulation or on walls or partitions of combustible sandwich type panel construction.
- Ventilation is and will remain sufficient to prevent development of a hazardous atmosphere during the hot work process.
- Hot work will not be conducted in a confined space, or all appropriate confined space entry permit requirements are in place.
- Containers which will be subject to hot work have been rendered free of flammable vapors and other combustibles.
- For work on walls or ceilings:

- Construction is noncombustible and lacks combustible covering or insulation.
- Combustibles have been moved away from the opposite side of the wall.
- Conduction of heat will not pose danger to adjacent areas.
- Building occupants (likely in cooperation with the Building Maintenance Reporter) have been notified of the hot work activity and the need to support the implemented fire safety precautions.

Fire Watch

The PAI will determine if a fire watch is required, and; if so, the PAI will also determine the number of fire watch individuals required. In general, the fire watch may not be the same person as the hot work operator. The role of the fire watch is to ensure that safe conditions are maintained during hot work operations and to take appropriate action in the event of a fire or other adverse event. The fire watch is responsible to stop hot work operations if unsafe conditions develop or are observed; initiate alarms/notify emergency personnel in the event of a fire, and; attempt to extinguish fires only when the fire is obviously within the capacity of the available extinguisher.

Persons designated as a fire watch must meet the following qualifications:

- Aware of the hazards posed by the hot work process;
- Aware of the hazards of the work site;
- Aware of work area fire alarm initiation/emergency responder notification procedures (including access to alarm pull stations, communication devices, and like equipment, as appropriate);
- Trained in use of portable fire extinguishers

At least one fire watch is required under the following conditions:

- Work is conducted in an area where other than a minor fire might develop.
- Work is done where flammables or combustibles are more than 35' away but are easily ignited by sparks.
- Work is done in an area where wall or floor openings could expose combustibles in adjacent areas.
- Work is done where combustibles are adjacent to partitions, ceilings, or roofs being worked on.

Additional fire watch individuals are required when combustible materials could be ignited by hot work operations that cannot be directly observed by the initial fire watch (i.e., combustibles on opposite sides of a wall, etc.). The fire watch must remain on-site to monitor for potential fires for a minimum of 30 minutes following completion of the hot work operation, and longer as specified by the PAI. The work site must be attended at all times until conclusion of the permit, including break times.

Sole Proprietors and Individual Operators

NFPA 51B contains provisions whereby a single person could serve as the PAI, hot work operator, and fire watch. This provision is limited to sites where hot work

operations are not under the control of another authority and where the work is customarily performed by one person. The provision requires the person to meet all qualifications/training to allow them to effectively serve in each role and to complete a checklist to serve as the permit. This provision should be implemented at UNL only after discussion with the State Fire Marshall's Office.

Conclusion of the Permit

After the area has been attended for the prescribed amount of time following conclusion of the hot work process, the fire watch carefully inspects the work and adjacent areas to verify the absence of smoldering fires. This inspection may extend to floors above and below the work and adjacent rooms depending on the location/type of hot work.

When the fire watch verifies absence of fire hazards, (s)/he signs the permit and notifies the PAI. The PAI then conducts a final inspection of the area and signs the permit. The permit is filed for one year.

Hot Work Permit

INSTRUCTIONS:

- A. Verify the precautions listed at right (or do not proceed with the work.)
- B. Complete and retain this permit for one year.

Date: _____

Location - Building & Floor: _____

Work to be done by:

(Name). _____

Nature of work to be done: _____

Special precautions: _____

Fire watch required? Yes _____ No _____

Name(s) of fire watch (if required): _____

The location where this work is to be done has been examined, necessary precautions taken, and permission is granted for this work. (See Part 2.)

Permit Expires _____
(Each permit is good for no more than 24 hours.)

Signed _____
Permit Authorizing Individual (PAI)

Time Started: _____ Completed: _____

Signed _____
Fire Watch or Individual performing the work

FINAL CHECK

Work area and all adjacent areas to which sparks and heat might have spread (including floors above and below and on opposite side of wall(s) were inspected 30 minutes after the work was complete and were found fire safe.

Signed _____
Permit Authorizing Individual (PAI)

Before approving any hot work permit, the PAI must inspect the work area and confirm that the following precautions have been taken to prevent fire in accordance with NFPA 51B.

Precautions:

- Available sprinklers, hose streams and extinguishers are in-service/operable.
- Hot Work equipment in good repair.

Requirements within 35 feet of work:

- Floors swept clean of combustibles.
- Combustibles removed or protected by fire resistant tarpaulins or metal shields.
- Flammable liquids, dust, lint and oil deposits removed.
- Explosive atmosphere in area eliminated.
- Combustible floors wetted down, covered with damp sand or fire-resistant sheets.
- All wall and floor openings are covered.
- Cover suspended beneath work to collect sparks.

Work on Walls or Ceilings:

- Construction is noncombustible and without combustible covering or insulation.
- Combustibles moved away from opposite side of the wall.

Work on Enclosed Equipment: (tanks, container, ducts, dust collectors, etc.)

- Equipment cleaned of all combustibles.
- Containers purged of flammable liquids/vapors.
- If entry is required, follow Confined Space Program.

Fire Watch:

- To be provided during and 30 minutes after operation including during coffee or lunch breaks.
- Fire watch may be required for adjoining areas, above and below.
- Fire Watch trained in use of equipment and in sounding fire alarm.
- Means of initiating notification to 911 is available.
- Fully charged and operable fire extinguisher is available in the immediate work area.

Other precautions taken:

- Area protected with smoke or heat detection.
- Ample ventilation to remove smoke/vapor from the work area.
- Lockout/tagout required.

Final Check:

- To be made 30 minutes after completion of any operation unless fire watch is provided.