



Title: Hot Work Protocols for City Owned Properties

Date of Origin: 11/04/19

Responsible Party: City Council

I. Policy

Hot work activities have the potential to cause fires and personal injury. To mitigate these risks; hot work permits are required prior to any such work. The safety protocols provided herein are to be followed by City employees engaged in hot work and any vendors hired under contract by the City to perform work that may be governed by this policy. These standards have been developed to reflect the City's insurance company's standards for Hot Work Permitting. Both employees and contractors are required to keep the necessary paperwork required by OSHA when conducting such activity. The City Hot Work Permit System shall be governed by the Department of Public Safety and the Department of Public Works as is practicable and pertinent.

II. Definition

Hot work is defined as any operation that generates heat, sparks or flame. Hot work activities can include: gas cutting, gas or electric welding, soldering, brazing, flame heating, thawing of pipes, torch-applied roofing, grinding and metal cutting.

III. Potential Hazards

Sources of fires caused by hot work operations often occur in one of two ways:

- A. The heat or flame from the activity directly ignites combustible or flammable materials located too close to the hot work operation; or
- B. Sparks fly or molten globules of metal roll away from the work or fall through cracks to lower levels onto unseen combustibles. The combustible material smolders and eventually bursts into flames, sometimes well after work has ended and employees have left the area.

IV. Contributing Factors to Hot Work Fires

- A. Lack of oversight of the hot work activity.
- B. Poor preparation of the work area before the hot work activity starts.
- C. Failure to identify potential fire exposures in the hot work area.
- D. Defective equipment or supplies.
- E. Poor housekeeping.
- F. Failure to provide adequate fire extinguishment.
- G. Failure to maintain fire watches, even during lunch breaks and after the end of the work day, and for at least one (1) full hour after hot work stops.

V. Common Failures

When permits are issued regularly, the process may become a formality and permits may be issued without a careful assessment of the work or verification that necessary precautions are

being taken. Many entities have experienced major fires because they trusted their facility to a contractor who "must know what they are doing or they would not be in business."

Contractors should be closely supervised. All rules and regulations that apply to employees should be equally applicable to contractors. When using outside contractors, written contracts should include requirements related to hot work procedures. In addition to written contracts, select contractors who have properly trained personnel and who have an awareness of the magnitude of the risks involved in hot work operations. City personnel should inform contractors about any flammable materials or hazardous conditions where special precautions must be taken.

VI. Protocol

A. When Hot Work permits should be used:

There are many times in the construction process, particular during the early stages, when there are very few, if any, combustibles around to ignite. A Hot Work Permit Program is still needed during this time. It is important to remember that workers could be injured from uncontrolled sparks created by hot work. Hot work programs should be in place for any job starting on the first day of construction and continuing on until the project is completed.

Ideally, all hot work operations should be conducted in designated, properly safeguarded areas, such as a maintenance shop or detached outside location. When work cannot be moved to a maintenance shop or outside location, a hot work permit should be obtained before conducting any hot work operations. The permit should only be issued after a trained supervisor has assessed the area, and has verified that all safety precautions are being taken.

B. Responsible Parties:

Promoting safe hot work practices starts with the engagement of management in the oversight of the various aspects of the hot work process, from start to finish. It is essential to understand that City employees and/or the general contractor or the Permit Authorizing Individual (PAI) is responsible for ensuring adherence to all aspects of the program for the work they are contracted to perform.

Permit Authorizing Individuals (PAIs) are employees assigned by the general contractor to:

1. Evaluate the exposures presented by the hot work activity.
2. Be familiar with applicable NFPA, OSHA and local fire codes.
3. Be responsible for conducting a pre-operational review of the work and administering all aspects of the Hot Work Permit Program.
4. Ensure all equipment to be used is in proper working order meeting manufacturers', OSHA and NFPA and local fire safety standards.
5. Establish fire watch criteria and duration of fire watch.
6. Notify the local fire department that hot work is being conducted.
7. Ensure that the site and hydrants are accessible to the fire department.
8. Assess the work area after hot work activity is completed and complete final sign off on the permit.

C. Fire Watch:

A fire watch is the first line of defense in protecting workers and property from harm during hot work activities. The role of the fire watch is to help 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.

The PAI will determine if a fire watch is necessary. A fire watch is necessary if any of the following conditions exist:

1. Appreciable amount of combustible material in building construction or contents are within thirty five (35) feet of the hot work;
2. Appreciable amount of combustibles are more than thirty five (35) feet away, but they may be easily ignited by sparks;
3. Wall or floor openings are within thirty five (35) feet that expose combustibles in adjacent areas, including confined spaces;
4. Combustibles materials are adjacent to the opposite side of metal partitions, walls, ceilings, floors or roofs and are likely to be ignited by conduction or radiation;
5. Hot work on equipment and other components, such as ductwork that may have flammable or combustible fuels or residue present; and
6. Hot work in or on vessels containing flammable or combustible contents or residue.

D. Precautions:

1. To extinguish any fires that may start, provide a fire watch for the involved area and include tours of the floors above and below.
2. The fire watch should be continuous during the hot work operation, during lunch breaks, etc., and continue for at least half (1/2) an hour after the work has been completed.
3. If the hot work ends near the time of a shift change, arrangements should be made for the patrols to continue into the next shift.
4. Equip fire watch staff with portable fire extinguishers and/or charged small hose lines and make sure they are trained in their use.
5. Fire watch staff also should know how to sound the fire alarm.
6. Use only equipment that is in good condition. Valves, regulators, hoses and torches should be thoroughly checked.
7. Before beginning, secure the gas cutting and welding cylinders so they will not overturn or be damaged, and verify that the protective caps are on all cylinders not in use.
8. When using electrical arc welding equipment, the ground clamp can be a source of ignition. The ground clamp should be carefully connected close to the work so it can be easily observed.
9. Welding, cutting or other hot work should be avoided in any building where sprinklers are out of service.

Here are industry standard precautions for Hot Work Permit situations within City facilities:

When working within thirty five (35) feet of the work area:

1. Prohibit hot work until surrounding floors have been swept clean.
2. If floors are of combustible construction, they should be adequately protected to prevent ignition.
3. Remove all flammable liquids from the area and clean up any oily deposits. Move combustibles at least thirty five (35) feet from hot work operations. If combustibles cannot be moved, they must be protected by metal guards or flameproof curtains or covers. Do not use ordinary tarpaulins.
4. Prohibit hot work until all wall and floor openings within thirty five (35) feet of the operations have been tightly sealed or otherwise protected with metal guards or flameproof tarpaulins

When working on walls and ceilings:

1. Do not work on combustible walls or ceilings, or those containing combustible insulation. Combustibles on the other side of the wall should be moved away so any heat that is transmitted through the wall will not ignite the combustibles.
2. When working on ceilings or upper levels of process equipment, fire resistant tarpaulins should be suspended beneath the work area to collect sparks.

When working on enclosed equipment:

1. Before working on enclosed equipment, remove any combustible residue from its interior. When working on duct systems, also remove any combustible screens or dust bags.
2. Prohibit hot work in or on vessels containing flammable or combustible contents or residue until they have been completely cleaned and purged. Use gas detectors to monitor for flammable or toxic gases if there is a potential that they could be released during the hot work operation.

Remember to conduct a final check-up of the work site:

After the hot work is finished, the permit should be returned to the supervisor. The site supervisor should return to the scene within two (2) to four (4) hours after the work has been completed to check the area. After this final check, the supervisor should complete and sign the permit.

VII. Recommended Best Practices

- A. Hot work should not be performed if the work can be avoided or can be performed in a safer manner. When practical, objects to be welded, cut or heated should be moved to a designated safe area.
- B. If hot work must be performed, a Hot Work Permit should be obtained from the PAI before the hot work begins.
- C. The PAI should inspect the work area to ensure all requirements of the Hot Work Program have been implemented before any work is allowed to start.
- D. Before the start of any hot work, ensure that there are adequate fire extinguishers of the proper type and quantity. Charged fire hose lines can also be an effective manual firefighting means. Ensure employees that might be called upon to use this manual firefighting equipment are properly trained.
- E. All instructions should be followed and all checklists filled out on the Hot Work Permit prior to performing any hot work. A Hot Work Permit should be filled out, and posted and remain at the hot work location until the hot work is completed in the area in which the hot work is being conducted.
- F. The permit is valid only for the shift in which the work is being done. Upon completion of the hot work, and after the fire watch period is completed and the area deemed safe, the PAI should sign the form indicating that hot work has been completed. A copy should be kept on file for the duration of the project.
- G. When fire watch is deemed necessary by the PAI, the fire watch should extend at least one (1) hour beyond the completion of work and should not be interrupted for breaks, lunch breaks or where the end of work is completed before the completion of the required one-hour duration of the fire watch.
- H. After the hot work is completed, complete the permit and return it to the supervisor.
- I. The PAI should return to the scene within two (2) to four (4) hours after the work has been completed to check the area.

HOT WORK PERMIT

IMPORTANT – Follow precautions indicated *

Prior to, during, and after any hot work, comply with recommended precautions in Travelers' Cutting, Welding and Hot Work Operations Guide and NFPA 51B.

This Hot Work Permit is required for any operation involving open flame or producing heat/sparks outside of designated hot work areas. "Hot Work" includes, but is not limited to: welding, brazing, cutting, grinding, soldering, thawing pipe, torch-applied roofing, or chemical welding.

Seek an alternative/safer method, not involving hot work whenever possible.

** Complete this Hot Work Permit (by tabbing through each highlighted area and typing in each field) including having the precautions followed, signed by someone in authority and hang this permit in the vicinity of the hot work operation. Areas not highlighted are intended to be completed on-site using pen. Once the hot work is completed and the area observed and signed off as being safe, sign this permit and retain it for review by Travelers Risk Control.*

Location/Area:
Work to be done:
Name(s) of Authorized Worker(s):
Name(s) of Personnel Assigned to Fire Watch:

Time started: _____ Completed: _____

I verify that the above location has been examined and the precautions marked below have been taken. Permission is granted for this work.

Name of Permit-Authorizing Individual (PAI): _____
(Print and sign)

~ PERMIT EXPIRES AT END OF CURRENT SHIFT~

Retain for review by Travelers

This section is to be completed by the PAI and kept at the work site.

HOT WORK PERMIT

Permit issue date: _____

Location/Area: _____



IMPORTANT! To save a copy of this form once filled in, you must choose File/Save As from the top menu bar, give it a unique name and save a copy to your computer. You may also print out a completed copy by clicking on the Print Form button.

PRINT FORM

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DANGER

PRECAUTIONS TO PREVENT FIRES

DO NOT PERFORM HOT WORK UNTIL THE FOLLOWING PRECAUTIONS HAVE BEEN TAKEN

CHECK WHEN APPLICABLE:
 Sprinklers are in service where present. Fire hose or portable extinguishers are operable and available in the area of work.
 Hot work equipment is in good repair.

PRECAUTIONS WITHIN 35-FT OF HOT WORK
 Combustibles storage/materials removed or covered with listed or approved materials (welding pads, blankets, curtains, or fire-resistive tarpaulins), metal shields, or noncombustible materials.
 For elevated work, extend the 35-ft distance by _____ ft.
 Combustible floors wet down or covered with fire-resistive noncombustible coverings or equivalent.
 Floors swept clean and trash removed.
 All wall and floor openings covered tightly.
 Flammable liquid, dust, lint, and oily deposits removed.
 Explosive atmosphere in area eliminated.
 Ducts and conveyors covered, protected, or shut down.

PRECAUTIONS FOR HOT WORK ON WALLS, CEILINGS, OR ROOFS
 Construction is noncombustible and without combustible coverings or insulation.
 Combustibles removed from other side of wall, ceiling, or roof.

PRECAUTIONS FOR HOT WORK ON ENCLOSED EQUIPMENT
 Enclosed equipment is cleaned of all combustibles.
 Containers are purged of flammable liquid/vapor.
 Monitor flammable gas/vapor prior to and during work. % LEL _____.
(Discontinue Hot Work if reading exceeds 10% of LEL or if positive change in % LEL is detected during work.)
 Pressurized vessels, piping, and equipment removed from service, isolated, and vented.
 For work on metal vessels or piping with combustible linings or parts, Additional Precautions provided as detailed below.

FIRE WATCH
 Continuous fire watch to be performed during and for at least 30 minutes following completion of hot work, including any breaks.
 Extend post hot work fire watch by _____ minutes per PAI's assessment of fire hazard.
 Fire watch is trained in use of fire extinguishing equipment and sounding alarm.
 Additional fire watch warranted/provided in adjoining areas, above and below.

ADDITIONAL PRECAUTIONS

This section is to be completed by the PAI and kept at the work site.

FINAL FIRE WATCH CHECK

The work area was observed for at least 30 minutes after work was completed and found fire safe.

Signed: _____
Date: _____ Time: _____