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|  <b>CITY OF<br/>TUCSON</b> | <b>City of Tucson</b><br>Central Safety Services<br>Number: S-010<br>Subject: | Page 1 of 8                           |
|   | <b>Hot Work</b>   | Effective Date:<br>January 1, 1997    |
|   |   | Reviewed/ Revised:<br>January 1, 2013 |

### 1.0 PURPOSE

To provide proper policies, practices and procedures for ensuring a safe environment while performing hot work at City of Tucson facilities or properties.

### 2.0 SCOPE

The policies and procedures contained in this section are intended to assist in identifying and complying with OSHA Safety Standards and Tucson Fire Department requirements. In all cases where there is a difference between specific OSHA standards and the Hot Work policies set forth in this chapter, the stricter of the two shall apply.

### 3.0 DEFINITIONS

**Hot Work:** means that which involves open flames or produces heat and/or sparks.

This includes but is not limited to:

- Soldering
- Flame cutting, such as oxy-acetylene or oxy-propane
- Brazing
- Oxy-acetylene welding
- Conventional arc welding or cutting
- MIG welding
- TIG welding
- Plasma arc cutting
- Grinding
- Thawing pipes
- Torch-applied roofing

**Fire Safety Supervisor:** Is a Department Risk Management Specialist or Safety Specialist, or other trained Supervisor designated by the department performing the work that is responsible for and authorizes hot work and has received the City of Tucson Hot Works training. The Fire Safety Supervisor makes certain that all safety precautions have been met before authorizing hot work and that the area is monitored for four (4) hours after the work is completed.

**Fire Watch:** Is an employee designated to work alongside the hot worker and maintain a constant vigil during the hot work for such things as sparks ignition or other fire hazards. The Fire Watch is trained in the use of fire extinguishers and/or small fire hose, and knows how to sound the alarm in case of fire. The Fire Watch remains in the area for one (1) hour after the hot work is completed to check for smoldering fires.

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**Hazardous Atmosphere:** means an atmosphere which by reason of being explosive, (including excess dust) flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic or otherwise harmful, may cause death, illness or injury.

#### **4.0 PROGRAM RESPONSIBILITIES**

##### **A. Department Director**

1. It is the responsibility of each Department Director to designate a Risk Management or Safety Specialist or other trained supervisor responsible for authorizing hot work in areas not specifically designed for such processes and responsible for the general administration of the department's Hot Works Program.
2. The Director shall ensure that the Supervisor whose division is performing hot work is provided with the training and authority to assess and immediately remedy any hazards occurring at the job site and ensure that all hot workers, fire watches, and their employees are properly trained and equipped to safely perform their work and comply with all applicable standards, codes and regulations.
3. The Director shall also ensure that city representatives overseeing contractor work which includes hot work activities be adequately trained in City of Tucson Hot Works policy and equipped to assess hazardous conditions on city job sites and stop contractor work when necessary.

##### **B. Hot Work Supervision**

1. It is the responsibility of the Supervisor who's unit is performing hot work to ensure that all aspects of this program are instituted and followed by Supervision and employees. The Supervisor shall issue Hot Work Permits and ensure compliance with all items on the required precautions checklist. All affected Supervisors will participate with Central Safety Services in coordinating appropriate training for employees covered by the program, including all levels of supervision.
2. The Supervisor whose division is performing hot work shall perform and document periodic audits of the Hot Work Program, ensuring that the necessary equipment, supplies and materials are available for the implementation of this program. The Supervisor whose division is performing hot work shall investigate all property damage, injuries, incidents and complaints related to fire safety and hot work.
3. Copies of all required hot work permits shall be filed with the Department for a period of one-year. Copies shall be forwarded to Central Safety Services, upon request.
4. Supervisors shall provide contractors with a copy of this program and ensure that contractors have been made aware of any flammable

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materials or other hazardous conditions that may exist in the area where they will be working.

### **C. Employees**

Each employee shall be responsible for complying with all the provisions of this program and properly employ the required personal protective equipment and shall immediately report to supervision all discrepancies, incidents or observed potential problems at their work site.

## **5.0 EDUCATION AND TRAINING**

Central Safety Services shall facility requests from Departments to conduct Training on the Hot Work Permit process.

## **6.0 GENERAL**

### **A. Permit System**

1. The City of Tucson has adopted the hot work permit system developed by Alliant Insurance Services, Inc. (Appendix A) the property insurance carrier for the City of Tucson. These permits are available from departmental or divisional Fire Safety Supervisors and from City Stores.

### **B. Permit Procedure**

1. All hot work done outside of designated welding shops must be preceded by a properly completed and authorized hot work permit. These policies apply at all City of Tucson Facilities and properties, regardless of whether work is performed by City employees, outside contractors, or volunteers.

### **C. Fire Protection**

1. Available sprinklers, hose streams and extinguishers must be in service and operable.
2. The employee performing Hot Work shall have a Portable Fire Extinguisher (Type ABC) at the point of work. The Portable Fire Extinguisher shall be supplied by the employee performing Hot Work. The Portable Fire Extinguisher intended for use shall not be removed from the wall mount of the facility and used by the employee performing Hot Work.

### **D. Welding/Cutting Equipment**

Hot work equipment shall be in good repair. Cutting torches shall be equipped with anti-flashback devices.

### **E. Hot Work Control Zones**

1. Requirements within 35 feet of hot work:
  - a. Flammable liquids, dust, lint, and oily deposits removed;
  - b. In areas where an explosive atmosphere may be present, the Supervisor of the division performing hot work shall monitor (sample)

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the atmosphere for explosive gases and, if present, eliminate the explosive atmosphere through ventilation prior to hot work and re-test;

- c. Floors swept clean;
  - d. Combustible floors wet down, covered with damp sand or fire resistant sheets;
  - e. Remove other combustibles where possible, otherwise protect with fire-resistive tarpaulins or metal shields;
  - f. Cover all floor and wall openings;
  - g. Fire-resistive tarpaulins suspended beneath elevated work;
  - h. Close all regular and fire doors to prevent sparks from escaping.
2. Work on Walls or Ceilings  
Ensure that construction is non-combustible and without combustible covering or insulation or protect accordingly and ensure that combustibles on other side of walls are removed.
  3. Work on Enclosed Equipment  
Enclosed equipment is cleaned of all combustibles and containers purged of all flammable liquids or vapors.

#### **D. Fire Watch/Hot Work Monitoring**

Fire Watch shall be provided during and for 60 minutes after work, including any coffee or lunch breaks. Fire Watch Monitors shall be equipped with suitable extinguishers/charged hose line and shall be trained in the use of this equipment and in sounding the fire alarm. If circumstances warrant, a Fire Watch shall be posted in adjoining areas, above, or below. Upon completion of the hot work and 60 minute fire watch, the area shall be monitored for an additional 4 hours to be certain no fires have started.

#### **E. Hot Work Permit Termination**

1. At the end of the monitoring period the permit shall be signed with the date and time in the lower right hand corner by the person who did the monitoring the Supervisor whose division is performing the hot work.
2. The top copy (designated Part 1) of the permit shall be returned to the Department/Division person or General Service's representative who initiated the work order that required the Hot Work Permit. The bottom or hard copy of the permit shall be posted at the work area for 48 hours as required by the Tucson Fire Department. The top or soft copy of the Hot work permit are to be kept on file and available for inspection by TFD or CSS for a period of one year.

#### **F. Personal Protective Equipment**

1. Employees shall wear long-sleeved shirts or jackets and long trousers made from a close-weave material that is unlikely to ignite. Leather

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aprons, jackets, chaps and gloves provide are acceptable protection. Pants should be without cuffs. No synthetic fabrics shall be worn.

2. Eye protection of the proper type, for the specific task to be done, shall be worn by those performing, observing or supervising the hot work or any grinding or similar related work which accompanies the process.
3. Appropriate shaded eye protection is required for Oxyacetylene welding.
4. Appropriate shaded eye protection for arc welding is required. (See Appendix B).
5. Gold or Silver lenses are prohibited.
6. Hearing protection shall be provided and worn where required.
7. Respiratory protection in the form of local exhaust ventilation or proper respirator shall be utilized.

#### **G. Hazardous Atmospheres**

No hot work shall be performed where oxygen-enriched atmospheres (containing 22.5% or more oxygen) or other hazardous atmospheres exist, or could reasonably be expected to exist, until such worksites have been properly tested and it has been determined that such hazards do not exist. In cases where it is appropriate, continuous monitoring should be performed by a qualified person to ensure that such a hazard does not develop during the hot work period.

#### **H. Soldering**

1. Soldering shall be performed under localized fume hood exhaust or in well ventilated areas. In areas where localized exhaust or ventilation may not be available, the employee shall wear respiratory protection.
2. Smoking, eating, drinking or apply cosmetics or lotions while handling lead-containing products is prohibited. Employees shall wash hands and face after working with lead.
3. The use of lead-containing solders when installing or repairing any part of a potable (drinking) water supply system is prohibited.

#### **I. Hazardous Containers**

Containers, such as drums, cylinders, pressure vessels, cans and tanks which have held flammable or explosive liquids or vapors (or unknown contents), shall not be subjected to hot work. The danger of explosion and fire are severe.

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## **J. Compressed Gas Cylinders**

1. Employees shall chain welding gas cylinders in place except when they are in a properly designed and maintained mobile cart. Valve caps shall be in place when equipment is not in use. Cylinders shall be upright and secured in a manner to prevent fall. Acetylene cylinders shall be stored upright. Transport of flammable gas cylinders in an enclosed vehicle or vehicle trunk is prohibited.
2. Employees shall not utilize compressed air to blow debris off skin or clothing, and shall not allow grease, oil or other petrochemical products to come into contact with oxygen fittings.
3. Employees shall stand to one side while operating valves and ensure that cylinders and regulators are kept in good physical condition. Cylinders shall not be exposed to mechanical damage or exposed to excessive heat or electrical arcs. Cylinders shall be hydrostatically tested at required periods by the suppliers and employees shall check date stamps on all compressed gas cylinders.
4. Prior to attaching regulators to cylinders, employees shall “crack” the valve momentarily to blow out any dust or debris that may have accumulated.
5. Employees shall follow this procedure when changing torch lines:
  - a. Release the pressure adjusting screw on the regulator to its limit - turn counter-clockwise until it is loose;
  - b. Open the cylinder valve slightly to let the hand on the high pressure gauge rise slowly. On oxygen cylinders, open the valve to its full limit, otherwise it may leak due to its design. On fuel cylinders, open the valve about three-quarters of a turn. This is enough and it will allow for speedy closure should the need arise. Never exceed 15 psi working pressure for acetylene gas;
  - c. Use soapy water to test for leaks. Inspect the hoses for damage.

**Appendix A – Facsimile  
Alliant Insurance Services, Inc. Hot Works Permit**

# HOT WORK PERMIT

**BEFORE INITIATING HOT WORK, CAN THIS JOB BE AVOIDED?  
IS THERE A SAFER WAY?**

This Hot Work Permit is required for any temporary operation involving open flames or producing heat and/or sparks. This includes, but is not limited to: Brazing, Cutting, Grinding, Soldering, Torch Applied Roofing and Welding.

- INSTRUCTIONS**
1. Fire safety supervisor:
- A. Verify precautions listed at right (or do not proceed with the work).
  - B. Complete and retain Part 1. (Part 1A is a copy for expanded hot work awareness).
  - C. Issue Part 2 to person doing job.

HOT WORK BEING DONE BY

EMPLOYEE

CONTRACTOR \_\_\_\_\_

DATE \_\_\_\_\_ JOB NUMBER \_\_\_\_\_

LOCATION/BUILDING AND FLOOR \_\_\_\_\_

NATURE OF JOB \_\_\_\_\_

NAME OF PERSON DOING HOT WORK \_\_\_\_\_

I verify the above locations have been examined, the precautions checked on the Required Precautions Checklist have been taken to prevent fire, and permission is authorized for this work.

SIGNED (Fire safety Supervisor/Operations Supervisor) \_\_\_\_\_

|                |      |      |          |
|----------------|------|------|----------|
| PERMIT EXPIRES | DATE | TIME | AM<br>PM |
|----------------|------|------|----------|

**NOTE: EMERGENCY NOTIFICATION ON BOTTOM OF FORM. USE AS APPROPRIATE FOR YOUR FACILITY.**



**Alliant Insurance Services, Inc.**  
2465 Campus Drive • First Floor  
Irvine, California 92612-1502

(888) 737-4752 . [www.alliantinsurance.com](http://www.alliantinsurance.com)

- REQUIRED PRECAUTIONS CHECKLIST**
- Available sprinklers, hose streams and extinguishers are in service/operable.
  - Hot Work equipment in good repair.
- Requirements within 35 ft (11m) of work
- Flammable liquids, dust, lint and oily deposits removed.
  - Explosive atmosphere in area eliminated.
  - Floors swept clean.
  - Combustible floors wet down, covered with damp sand or fire-resistive sheets.
  - Remove other combustibles where possible. Otherwise protect with fire-resistive tarpaulins or metal shields.
  - All wall and floor openings covered.
  - Fire-resistive tarpaulins suspended beneath work.
  - Protect or shut down ducts and conveyors that might carry sparks to distant combustibles.
- Work on Walls, ceiling, or roofs
- Construction is noncombustible and without combustible covering or insulation.
  - Combustibles on other side of walls, ceilings or roofs are moved away.
- Work on enclosed equipment.
- Enclosed equipment cleaned of all combustibles.
  - Containers purged of flammable liquids/vapors.
  - Pressurized vessels, piping and equipment removed from service, isolated and vented.
- Fire watch/Hot Work area monitoring
- Fire watch will be provided during and for 60 minutes after work, including any coffee or lunch breaks.
  - Fire watch is supplied with suitable extinguishers, and where practical, a charged small hose.
  - Fire watch is trained in use of equipment and in sounding alarm.
  - Fire watch may be required in adjoining areas, above and below.
  - Monitor Hot Work area for 4 hours after job is completed.
- Other Precautions Taken:
- \_\_\_\_\_

3301

IN CASE OF EMERGENCY:

CALL: \_\_\_\_\_

AT: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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## **Appendix B**

This appendix is intended to highlight and provide quick reference for critical procedures and to familiarize employees with City of Tucson work rules and procedures for hot work. Numerous OSHA standards found in the General Industry Standards ( 29 CFR 1910 ) and the Standards for the Construction Industry ( 29 CFR 1926 ) will apply to various hot work and should be consulted. These include:

### **From the General Industry Standards**

- 29 CFR 1910, Occupational Health and Environmental Control
- 29 CFR 1910, Subpart H -- Hazardous Materials
- 29 CFR 1910, Subpart I -- Personal Protective Equipment
- 29 CFR 1910, Subpart J -- General Environmental Controls
- 29 CFR 1910, Subpart L -- Fire Protection
- 29 CFR 1910, Subpart M -- Compressed Gas and Compressed Air Equipment
- 29 CFR 1910, Subpart O -- Machinery and Machine Guarding
- 29 CFR 1910., Subpart P -- Hand and Portable Power Tools and Other Hand-Held Equipment
- 29 CFR 1910, Subpart Q -- Welding, Cutting and Brazing
- 29 CFR 1910, Subpart S -- Electrical
- 29 CFR 1910, Subpart Z -- Toxic and Hazardous Substances

### **From the Construction Industry Standards**

- 29 CFR 1926, Subpart C -- General Safety and Health Provisions
- 29 CFR 1926, Subpart D -- Occupational Health and Environmental Controls
- 29 CFR 1926, Subpart E -- Personal Protective and Lifesaving Equipment
- 29 CFR 1926, Subpart F -- Fire Protection and Prevention
- 29 CFR 1926, Subpart I -- Tools - Hand and Power
- 29 CFR 1926, Subpart J -- Welding and Cutting
- 29 CFR 1926, Subpart K -- Electrical
- 29 CFR 1926, Subpart Z -- Toxic and Hazardous substances