

## I. SCOPE & EXPECTATIONS

Fire protection impairment is the shutdown of any fire protection systems including:

- Fire alarm systems
- Automatic sprinklers
- Underground fire mains, including control valves (PIV, OS&Y, etc.)
- Fire hydrants
- Fire pumps
- Fire protection water storage tanks or reservoirs
- Systems supplying fire systems
- Special fire extinguishing systems (e.g. water mist, foam, carbon dioxide, FM200 or dry/wet chemical)

The expectations of the UC Merced fire protection impairment process are to:

- **Provide a safe environment to University students, faculty, staff and visitors**
- **Protect University assets**
- **Minimize the frequency of impairments to the fire protection systems**
- **Minimize the impairment extent/area (e.g. impair a zone, rather than the entire building.)**
- **Minimize the impairment duration**
- **Minimize the potential sources of fire**

All University work crews, or outside contractors, must be knowledgeable and familiar with the impairment protocol before beginning any construction or repairs on University buildings. All construction activities involving the impairment of a fire alarm and/or protection system require the approval of the Campus Fire Marshal. Wherever applicable, the contractor shall follow the UC Merced Fire System Impairment Protocol.

## II. DEFINITIONS

*Fire Watch: a temporary measure intended to ensure continuous and systematic surveillance of a building or portion thereof by one or more qualified individuals for the purposes of identifying and controlling fire hazards, detecting early signs of unwanted fire, raising an alarm of fire and notifying the fire department. Impairment Fire Watch entails the entire affected area of the impairment (e.g. entire building, floor). Hot Work Fire Watch entails the immediate area of the hot work area which is defined by “area exposed to sparks, hot slag, radiant heat, or convective heat as a result of the hot work”.*

*Planned Impairment: Occurs when all or part of a fire protection system is shut down for activities such as maintenance, renovation or construction.*

*Emergency Impairment: Occurs when an accident or unforeseen event leads to an unplanned fire system outage. Protection must be shutdown suddenly. Scope may be extensive.*

*Hidden: A fire system outage that exists without the knowledge of those responsible to keep fire protection systems in service. Often found while inspect/testing.*

### III. PLANNED IMPAIRMENT PROTOCOL

To assure that unauthorized persons and/or outside contractors do not cause impairment to a fire protection system, the following impairment process will occur prior to any outage:

#### a. Planning and Preparation process:

Requestors for planned outages to the fire protection system must fill out the UC Merced Facilities Fire System Work Permit ([Attachment 1](#)) and email to UC Merced FM Help Desk ([fmhelp@ucmerced.edu](mailto:fmhelp@ucmerced.edu)) or distribution to the Impairment Coordinator. Approval, coordination and schedule must be received from the Impairment Coordinator before proceeding.

#### **Please Note:**

- Bagging or capping smoke detectors *is not* allowable
- Hot work *is not* permitted when the following conditions exist:
  - In buildings equipped with fire sprinklers, where the entire sprinkler system is impaired
  - When an entire building fire detection system is impaired
- **ALL** hot work is subject to the UC Merced Hot Work permit Procedure ([see attached](#))
- All necessary tools and materials must be on site before the impairment begins.
- 5-business day advanced notification for planned impairments is required. Response time will be within 72-hours of request.

#### Impairment Coordinator responsibilities:

- Notify Zurich at least 24 hours (earlier if impairment date known) prior to a planned impairment and at system restoration. For emergency and hidden impairments, notify Zurich Risk Engineering at the first opportunity.
- Follow up and develop a root cause and preventative actions following an emergency and/or hidden impairment.
- Notify UC Public Safety, Fire Department, EH&S, Campus Fire Marshal, Central Plant and Facility Manager.
- Send Facility Advisory to campus where applicable.
- Schedule and manage coordination meetings to review requests.
- Determine any temporary fire protection requirements.
- Approve or deny the requested outage.

- Coordinate with the Campus Fire Marshal to determine if the fire protections impairment requires Fire Watch.
- Coordinate Fire Watch ([see UCM Fire Watch procedure](#)) which may involve Facilities staff and/or contractors.
- Eliminate potential ignition sources.
- Confirm fire extinguishers or water supply hose is available.
- Coordinate to post notification on entrances to impaired buildings ([Attachment 2](#)) and on the system (notice from Zurich).
- Coordinate with staff/requestor to make building announcements (where applicable).
- Coordinate with staff/requestor to perform the impairment.

**b. Impairment:**

- In all University buildings where impairment of a fire protection system takes place, the Impairment Coordinator shall post signage ([Attachment 2](#)) at all building entrances stating “WARNING: The fire alarm system and/or fire sprinkler system is temporarily out of service. If smoke or fire is noted, immediately call 911.” Posted (Date here).
- The printed impairment notice (from Zurich) is affixed to the valve or system for the duration of the outage. A single and separate tag will be used for each valve or system that is taken out of service. The tag(s) should be labeled (e.g. 1 of 5) for inventory purposes so all valves are opened when work is complete.
- Assessment of EI-LOTO (follow UC Merced protocol).
- Relocate combustibles away from the area.
- Provide a continuous or periodic Fire Watch (as determined by the Campus Fire Marshal).
- In accordance with **NFPA 13, 25 and 72**, perform the impairment work.

**c. Post-Impairment:**

After completing the work, it is important to assure that the fire protection has been properly restored. Eight steps are required to assure the protection has been restored. Each step shall be verified by the Impairment Coordinator or designate:

1. Promptly restore the impaired systems upon completion of work.
2. Verification the impairment is restored.
3. Testing is done as needed to confirm fully operational systems.
4. Main Drain Test required for all sprinkler systems impacted by a closed valve(s).
5. For underground repairs, flush systems including hydrants and pumps as needed to ensure debris is absent.
6. Once work has been completed, all signage shall be removed from entrance doors. In buildings with an announcement system, an announcement shall be made making building occupants aware that the impairment is complete.

7. Notify Zurich, Fire Department, EH&S, Campus Fire Marshal, Fire Life Safety staff and Facility Manager the systems are returned to service.
8. Collect and file all fire system impairment notices, including fire watch log.

#### **IV. EMERGENCY IMPAIRMENT PROTOCOL**

When an Emergency Impairment occurs, the steps in the Planned Impairment protocol should be implemented immediately as well as addressing the following:

##### **a. Additional measures:**

1. Expedite the work
2. Limit impairment duration
3. Investigate the cause
4. Consider preventative actions

#### **V. HIDDEN IMPAIRMENT PROTOCOL**

When a Hidden Impairment occurs, the steps in the Planned Impairment protocol should be implemented immediately as well as addressing the following:

##### **a. Additional measures:**

1. Manage the impairment
2. Investigate the cause
3. Consider preventative actions

**Note to the Requestor:** Complete all portions of this permit before any impairment. Email the completed form to UC Merced FM Help Desk ([fmhelp@ucmerced.edu](mailto:fmhelp@ucmerced.edu)) for distribution to the Impairment Coordinator. Approval, coordination and schedule must be received from the Impairment Coordinator before proceeding.

**REQUESTOR INFORMATION**

Name: \_\_\_\_\_ Phone Number: \_\_\_\_\_  
 Affiliation: \_\_\_\_\_ Email: \_\_\_\_\_  
 Permit Number: \_\_\_\_\_ Impairment Coordinator \_\_\_\_\_

**TYPE OF IMPAIRMENT**

Maintenance     Testing     Repair     Freeze Up     Renovation/Construction

**SYSTEM SHUT OFF**

Sprinkler     Fire Pump     Public Water Main     Yard Main     Reservoir/Tank     Fire Hydrant  
 Alarm/detection system     Special extinguishing system     Other: \_\_\_\_\_

**LOCATION**

Campus-wide     Building/Location(s): \_\_\_\_\_

**SPECIFIC SYSTEMS SHUT OFF OR OUT OF SERVICE**  
 (e.g. Science & Engineering Sprinklers 3<sup>rd</sup> floor)

**REASON FOR AND DESCRIPTION OF IMPAIRMENT**  
 (e.g. planned renovations)

**TYPE OF OPERATIONS IN AFFECTED AREA**  
 (e.g. Lab, normally occupied M-F 9:00am to 8:00pm)

**SHUTOFF AND RESTORATION DETAILS**

Time of Requested Shut Off: \_\_\_\_\_  am  pm    Date Requested: \_\_\_\_\_

Estimated Date/Time of Restoration: \_\_\_\_\_

Will activity continue in impacted area until system is restored?     Yes     No



**\*\*WARNING\*\***

The fire alarm system and/or sprinkler system  
is temporarily out of service.

If smoke or fire is noted, immediately call 911

POSTED: \_\_\_\_\_

## FIRE WATCH PROCEDURES

### FIRE PROTECTION SYSTEMS IMPAIRMENTS

*These protocols apply to Fire Watch for fire protection systems impairments only. They do not apply to Fire Watch for Hot Work Permits, which is a separate protocol.*

1. Fire watch personnel shall be trained in the use of a fire extinguisher.
2. The number of required fire watch personnel shall be sufficient for the size of the project to be able to walk the entire fire watch area every 30 minutes as determine by the DCFM.
3. Fire watch personnel shall be dedicated to fire watch and have no other additional duties or responsibilities for the duration of fire watch.
4. Fire watch personnel must be equipped with an appropriate means of communication to report fires or other unsafe conditions to UCM Campus Dispatch (radio, cell phone).
5. Fire watch personnel must physically walk the entire fire watch area continually while fire watch is in progress.
6. All accessible rooms and spaces must be viewed while physically walking the fire watch area, as determined by the DCFM.
7. Fire watch personnel shall immediately report fires, smoke, smell of smoke, activation of automatic extinguishing systems to the UCM Campus Public Safety Dispatch Center by calling 9-1-1 or

communicating via radio transmission. Activate fire alarm pull station as available.

8. Cell phone coverage in the Fire Watch Area must be determined if a cell phone is the means of communication to UCM Dispatch.
9. Fire watch personnel shall complete the fire watch log every 30 minutes logging the time, location, and initials.
10. Fire watch personnel shall turn in the fire watch log to Impairment Coordinator.
11. Fire watch must be conducted whenever the fire alarm system, fire sprinkler system, fire pump, water supply to fire protection systems, or any other fire protection system is impaired, disabled, or shut down, regardless of the time length of impairment (see University Impairment Protocol.)
12. If the water supply to a fire pump is shut off, the fire pump must be shut off and fire watch instituted.
13. If the water supply is inadequate for the design of any fire protection system for any building on campus, fire watch must be immediately implemented in the affected buildings until a sufficient water supply is restored. (Water storage tank supply depleted or diminished below acceptable levels).
14. Power failures extending beyond 24 hours where the fire alarm battery supply may be depleted, fire watch must be conducted until the fire alarm batteries are fully charged and functional.
15. No Hot Work during impairment.





# FIRE WATCH LOG

<b>BUILDING:</b>		<b>INDIVIDUAL RESPONSIBLE TO OVERSEE THE FIREWATCH</b>	
<input type="checkbox"/> Fire Watch for Entire Building <input type="checkbox"/> Fire Watch for Specific Area Specify areas:		Name: _____ Title: _____ Date: _____	
<b>COMMUNICATION MEANS</b>		<b>IMPAIRMENT</b>	
<input type="checkbox"/> Radio <input type="checkbox"/> Cell phone		<input type="checkbox"/> Fire alarm <input type="checkbox"/> Fire sprinkler <input type="checkbox"/> Other: _____	

TIME	LOCATION	INITIALS
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TIME	LOCATION	INITIALS
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# UC Merced

## Hot Work Permit Procedure

### (Short Form)



**Purpose:**

To provide a short procedure that details the general requirements, purposes and forms to use when performing hot work at the UC Merced (UCM) main campus, UCM ancillary locations and any UCM leased facilities.

**Scope:**

This procedure applies to all persons performing “Hot Work” including employees and contractors.

**Definitions:**

*Hot work: any work with equipment that produces a spark or an open flame, or a process that generates excessive heat. If there is a risk of fire, the process is by definition “Hot Work.” Also, it should be noted that any work involving electric or gas welding, cutting, brazing or similar flame producing operations is also considered “Hot Work”*

*Fire Watch: a temporary measure intended to ensure continuous and systematic surveillance of a building or portion thereof by one or more qualified individuals for the purposes of identifying and controlling fire hazards, detecting early signs of unwanted fire, raising an alarm of fire and notifying the fire department. Impairment Fire Watch entails the entire affected area of the impairment (e.g. entire building, floor). Hot Work Fire Watch entails the immediate area of the hot work area which is defined by “area exposed to sparks, hot slag, radiant heat, or convective heat as a result of the hot work”.*

**Hazards of hot work are:**

- Fire, property or personal loss;
- Explosion of compressed gases;
- Flammable or combustible vapors, solids, liquids near the area of the hot work;
- Processes involving oxygen and fuel gases or flames on torches;
- Metal splatter and electric shock potential from welding or arc flashes;
- Confined space issues involving any “Hot Work.”

**Procedures for Hot Work Permits are intended to:**

- Establish areas for cutting and welding, and procedures for cutting and welding, in other areas;
- Designate an individual responsible for authorizing cutting and welding operations in areas not specifically designed for such processes;
- Ensure that supervisors and employees are suitably trained in the safe operation of their equipment and the safe use of the process;
- Advise all contractors about flammable materials or hazardous conditions of which they may not be aware.

**Cutting or welding shall not be permitted in:**

- Areas not authorized by Designated Campus Fire Marshal (DCFM);
- Sprinklered buildings when fire protection is impaired;
- The presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air), or explosive atmospheres that may develop inside uncleansed or improperly prepared tanks or equipment which have previously contained such materials, or that may develop in areas with an accumulation of combustible dusts within 35 feet of the designated work area.

**Hot Work Procedures:**

Before hot work is initiated, the DCFM or designee shall determine that a source of ignition can be safely used. In locations where flammable vapors may be present, precautions shall be taken to prevent ignition by eliminating or controlling sources of ignition. A source of ignition shall not be introduced into an area until all of the following required actions have been completed:

- Tests for the presence of flammable gases and vapors shall be made when the concentration of flammable gases or vapors may reasonably be expected to exceed 20 percent of the lower explosive limit (LEL). The tests shall confirm that the concentration of flammable gases and vapors does not exceed 20 percent of the LEL;
- Oil accumulations or other combustible materials shall be removed or protected from ignition when present in exposed areas;
- The gauge valves shall be closed and the gauges drained, or the gauge glasses shall be guarded when gauge glasses contain flammable liquids, vapors or gases and are exposed to the spatter of molten metal;
- A source of ignition shall not be used where the concentration of flammable gases or vapors exceeds 20 percent of the LEL;
- Suitable fire extinguishing equipment shall be readily available in the area where hot work is performed;
- That a “trained” fire watch is available and shall remain at the site for at least 60 minutes after the hot work is completed.

**Hot work permit:**

A written and numbered hot work permit (attachment 1) shall be issued by the DCFM or designee, before a source of ignition is used. As part of this hot work permit issuance procedure, the employer shall verify that all of the required actions identified have been completed before a hot work permit is issued. The employer’s supervisor designee shall then complete and sign the Hot Work permit.

The hot work permit shall contain the following information:

- The effective time and date;
- The place of use;
- The hours during which the source of ignition may be used, not to exceed 24 hours;
- The specific location or piece of equipment where the source of ignition will be used;
- The nature of the use;
- The nature of the use of the source of ignition;
- Any special precautions or limitations to be observed before, during or after the use of the source of ignition, including the need for a fire watch.

**UC Merced DCFM shall revoke the permit under the following conditions:**

- When circumstances would make the continued use of the source of ignition hazardous;
- Any time the conditions of its issuance change;
- Inactivity of permitted hot work in excess of two hours unless test(s) determines that the LEL is less than 20%.

**Record Keeping:**

- In addition to providing a copy with the DCFM, the supervisor or person designated by Department will keep the hot work permit for at least six months.



# Permit for welding, cutting, hot work ZURICH

**BEFORE STARTING HOT WORK, REVIEW ALL SAFETY PRECAUTIONS.  
CAN THIS JOB BE AVOIDED OR IS THERE A SAFER WAY?**

This permit is required for any temporary operation involving open flame or producing heat and/or sparks: welding, cutting, brazing, grinding, soldering, or using a torch to thaw piping or heat material. The permit applies to only this job, in the area specified, during the time and date noted.

### Instructions

- Supervisor:
1. Complete precaution and safeguard checklist at night.
  2. Complete the form and retain Part 1.
  3. Issue Part 2 to competent person doing the job.
  4. Verify fire watch.

### Permit information

Hot work done by:

- Employee
- Contractor

Permit number \_\_\_\_\_

Location/building/floor \_\_\_\_\_

Work to be done \_\_\_\_\_

Person doing job (print and sign name) \_\_\_\_\_

Supervisor signature \_\_\_\_\_

I have verified that the above location has been inspected and the required precautions and safeguards have been taken. Permission is authorized only for the above work.

Date permit expires \_\_\_\_\_

Date work completed \_\_\_\_\_

Welder signature \_\_\_\_\_

### Precaution and safeguard checklist

- Sprinkler protection in service and hose and extinguishers available.
- Hot work equipment in good repair.

### Requirements within 35 feet (11 meters) of work

- Flammable liquids and combustible material removed from area.
- Floors swept and overhead structure clean from dust, lint and debris.
- Fire-resistant covers and metal shields provided as needed.
- All floor and wall openings covered and/or protected.
- Walls/ceilings: remove combustibles away from opposite side or adjacent structures.

### Work on enclosed equipment

- Adequate ventilation provided.
- Thoroughly clean and remove all flammables and combustibles.
- Atmosphere checked with gas detector.
- Purge any flammable vapors.
- Concealed space/lockout permits, if required.

### Fire watch

- Trained and equipped fire watch provided during operations and at least 30 minutes after. (Note: 60 minutes for torch applied roofing.)
- A final check-up of work area and adjacent areas must be conducted every 30 minutes until 4 hours after completion.

### Special instructions

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Final check-up date \_\_\_\_\_

Fire watcher signature \_\_\_\_\_

Time \_\_\_\_\_

Time \_\_\_\_\_

Time \_\_\_\_\_

Time \_\_\_\_\_

Fire watcher signature \_\_\_\_\_

Time \_\_\_\_\_



# WARNING! HOT WORK IN PROGRESS WATCH FOR FIRE!

**In case of an emergency**

Call \_\_\_\_\_

At \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### Fire watch

Maintain watch throughout work. Watch must be maintained uninterrupted throughout lunch, breaks and ensuring shifts.

Maintain watch for 30 minutes following the completion of work (60 minutes for torch-applied roofing).