

# Hamilton College Occupational Health and Safety Procedures

## PROCEDURE 4.0—HOT WORK PROGRAM

### 4.1 INTRODUCTION

#### **Purpose**

Regulations promulgated by the Occupational Safety and Health Administration (OSHA—29 CFR 1910.252—Welding, Cutting and Brazing) and the NYS Office of Fire Prevention and Control (OFPC—NYS Fire Code Chapter 26—Hot Work) require facilities to develop procedures to protect both human health and welfare, and the facility itself, from the hazards posed by hot work in the workplace. This program is intended to provide the Hamilton College community with the guidance necessary to comply with these regulations.

#### **Scope**

Hamilton College is committed to providing a safe and healthful work environment for both its employees and the greater college community. The following Hot Work Program (HWP) has been developed to eliminate or minimize risks to personnel, students, and campus facilities. While the greatest hot work risks arise from spark/slag producing activity (welding, cutting, brazing), other forms of hot work (pipe soldering, pipe thawing, etc.) may also present risks in the form of radiant heat and/or open flame. As such, certain elements of this program will pertain to all types of hot work activity, and others will only address the more dangerous activities that produce sparks.

This HWP includes:

- Identification of Responsibilities;
- Prohibited Hot Work Areas/Activities;
- Approved Hot Work Areas;
- Hot Work in Non-Approved/Designated Areas;
- Special Considerations for Other Hot Work;
- Fire Watch;
- Contractors.

#### **Applicability**

The Director of Environmental Protection, Safety & Sustainability (EPS&S) will maintain and update the College's written Hot Work Program, and will work primarily with the Physical Plant and Studio Art departments to ensure compliance with these procedures.

### 4.2 RESPONSIBILITIES

#### **Management**

The Hamilton College administration shall recognize its responsibility for the safe usage of cutting/welding/brazing equipment on its property, and shall:

- Establish areas where cutting/welding/brazing may be performed safely and other areas where additional procedures for cutting/welding/brazing are required;
- Designate those responsible for authorizing cutting/welding/brazing activities in areas where safety procedures are required;
- Require adequate training for employees/personnel involved in performing and/or supervising cutting/welding/brazing activities;

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- Advise all contractors about flammable materials and/or hazardous conditions of which they may not be aware; and
- Extend certain provisions of this procedure to activities other than cutting/welding/brazing, such as soldering, pipe-thawing, etc.

### Department Supervisors

Department supervisors are responsible for ensuring that hot work executed in areas under their supervision is in conformance with these procedures. They are specifically responsible for ensuring:

- Personnel performing hot work use safe and approved equipment, and that they are adequately trained on such equipment;
- Appropriate safety/fire protection/extinguishing equipment is available for all hot work personnel; and
- Combustible materials are adequately protected from ignition sources.

### Hot Work Personnel

Individuals engaged in hot work are required to:

- Have approval from their supervisor before beginning any hot work activity;
- Perform hot work activities only where conditions are safe to do so;
- Continue to perform hot work only so long as conditions are unchanged from those under which approval was granted.

### 4.3 PROHIBITED HOT WORK AREAS/ACTIVITIES

Hot work may not be performed under the following circumstances:

- In areas not authorized by management (i.e. officers, department heads, supervisors);
- In buildings with fire safety systems when such protection is impaired;
- In the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids or dusts in air);
- Inside or upon tanks or vessels of any size, or inside confined spaces which have the potential to hold an explosive atmosphere;
- In areas near the storage of large quantities of exposed, readily ignitable materials such as bulk sulfur, baled paper or cotton.

### 4.4 APPROVED AREAS FOR CUTTING/WELDING/BRAZING

#### Approved/Designated Areas

3 areas on campus will generally be understood as being specifically designated and/or approved for cutting/welding/brazing, along with other types of hot work. These 3 areas include:

- Physical Plant maintenance garage;
- List Art Department metal sculpture studio (Room # 113); and
- Outdoor maintenance areas where there is no flammable or combustible material within 35 feet of the immediate work area.

#### Requirements of Approved/Designated Areas

These 3 locations will “generally” be considered exempt from hot work permit and fire-watch requirements, unless otherwise required following the pre-hot work check (see below) as long as the following criteria are met:

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- Appreciable combustible material must not be located within 35 feet of the primary hot work area;
  - While combustible material within the 35 foot clearance area should be relocated during hot work to the greatest extent possible, limited materials may be isolated by means of appropriate shielding or guarding;
- Work floors or surfaces must be of non-combustible construction (concrete), or a suitable non-combustible outdoor environment (soil/stone);
- Floor surfaces (and the entire hot work area in general) should be well maintained from a housekeeping perspective;
- Flammable materials, or empty containers formerly holding flammable materials, must not be stored in the immediate work area;
- Heavy concentrations of dust, or actual/potential explosive atmospheres (from gases, dusts, vapors, liquids) must not be present in the immediate work area;
- Walls and partitions of the approved/designated area must be of non-combustible construction, any holes or openings through those partitions must be tightly covered, shielded or guarded so as to prevent the passage of sparks or slag, and (where metal walls/partitions exist in the hot work area) combustible materials must be adequately relocated on the other side of the wall;
- Mechanical local exhaust ventilation will be provided for all cutting/welding/brazing operations conducted inside buildings, where the room space is less than 10,000 cubic feet and/or the room has ceilings less than 16 feet in height;
- Visible signage reading “Caution—Hot Work In Progress—Stay Clear” shall be conspicuously posted at entrances to the work area to warn others, and flash shielding will be utilized to protect others as needed against UV radiation;
- Safety equipment, including an emergency eye wash, a fire blanket, and properly sized/rated fire extinguishers, will be appropriately staged and maintained in a functional state of readiness; and
- A pre-hot work check is conducted by those authorized to perform hot work activities, in accordance with form 4-1 below, and it is determined that a hot work permit is not required.

### **4.5 CUTTING/WELDING/BRAZING IN NON-APPROVED/DESIGNATED AREAS**

#### **Non-Approved/Designated Areas**

All areas on campus, other than the 3 identified above, where cutting/welding/brazing is to be performed are not considered approved/designated areas. Therefore, both form 4-1 (pre-hot work check) and form 4-2 (hot work permit) below must be completed and strictly adhered to.

#### **Hot Work Permit Requirements for Work in Non-Approved/Designated Areas**

The purpose of a hot work permit is to assess the occupational and structural hazards posed by the hot work, and to establish the necessary precautions and hazard control measures that will minimize the risks of those hazards manifesting themselves. Unlike cutting/welding/brazing activities in approved/designated areas, hot work performed in non-approved/designated areas “generally” have some risk which cannot be engineered out, and hence must be procedurally managed with alternate control strategies. The following steps must be followed in order to perform cutting/welding/brazing hot work activities in any non-approved/designated area:

- Personnel authorized by their supervisors to perform cutting/welding/brazing hot work in non-approved/designated areas must first assess the occupational and structural hazards posed by the work using form 4-1 (pre-hot work check).
- Upon completion of form 4-1, department supervisors will be responsible for reviewing the form, and for determining the necessary precautions and control measures to be employed. Supervisors

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will make the necessary determinations by way of form 4-2, the hot work permit, which typically will also include a fire watch.

- Form 4-2, the hot work permit, will be:
  - Signed by all personnel involved in the hot work activity;
  - Posted at the work site for the duration of the work;
  - Closed out at the conclusion of the work; and
  - Turned back into the supervisor for storage in permanent records.

### **4.6 SPECIAL CONSIDERATIONS FOR OTHER HOT WORK ACTIVITIES**

#### **Other Hot Work Activities**

Other hot work activities exist that are beyond the scope of the OSHA cutting/welding/brazing standard, but are regulated under the OFPC hot work standard. As noted above, they include activities where radiant heat and/or open flames are utilized, such as pipe soldering/sweating, pipe thawing, or the installation of torch-applied roofing systems, or in certain situations where sparks are produced during grinding.

#### **Requirements for Other Hot Work Activities**

Just as with the cutting/welding/brazing hot work activities, personnel engaged in other types of hot work are required to assess the occupational and structural hazards posed by the work using form 4-1 (pre-hot work check). Because the risks posed by heat, open flame and grinding are different than those posed by flying sparks and slag from welding, a more general set of considerations will be taken into account on form 4-1. In the event the pre-hot work check indicates that a hot work permit is required (form 4-2), personnel will submit completed form 4-1 to their supervisor, who is then responsible for completing form 4-2 and authorizing the hot work accordingly.

### **4.7 FIRE WATCH**

Where and when required by the hot work permit (form 4-2), a fire watch will be posted with the following responsibilities:

- Fire watch personnel shall have fire-extinguishing equipment readily available and be trained in its use;
- Fire watch personnel shall be familiar with the facilities and procedures for sounding an alarm in the event of a fire;
- Fire watch personnel shall watch for fires in all exposed areas, and try to extinguish them only when obviously within the capacity of the equipment available, or otherwise they must sound the alarm immediately; and
- A fire watch shall be maintained for a half-hour or as otherwise necessary after completion of hot work permitted activities to detect and extinguish smoldering fires.

### **4.8 CONTRACTORS**

When on site contractors are required to engage in hot work, they will either use this hot program, or use one of their own that is at least as stringent as the procedures contained herein.

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### **4.9 THE HOT WORK PERMIT SYSTEM**

Forms 4-1 and 4-2 together comprise the hot work permit system from a day-to-day functional perspective. However, it is only when some element of the work to be performed cannot be effectively controlled/eliminated that form 4-2, the hot work permit, will be issued. When form 4-2 is issued, it must be prominently placed near the work area to warn others who may enter of the hazardous activities being performed.

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## FORM 4-1 PRE-HOT WORK CHECK

<b>Prerequisite Requirements</b>		
1. Is welding, cutting, brazing, or other hot work to be performed?	<input type="checkbox"/> No—hot work permit not required—stop here.	<input type="checkbox"/> Yes—continue onto question 2.
2. Is equipment to be used in good working order, and properly inspected or tested as required?	<input type="checkbox"/> No—do not start work—get equipment fixed.	<input type="checkbox"/> Yes—continue onto question 3.
3. Have all personnel been provided with applicable PPE (gloves, eye protection, shielding, dust mask, etc.)?	<input type="checkbox"/> No—do not start work—get proper equipment.	<input type="checkbox"/> Yes—continue onto question 4.
4. Is a fully charged, operable and appropriately rated fire extinguisher available at the site?	<input type="checkbox"/> No—do not start work—get proper equipment.	<input type="checkbox"/> Yes—continue onto permit determination.

### Hot Work Permit Determination For Soldering/Other Activities

Condition	N/A	Condition Met	Condition Not Met—Permit Required
Combustible materials (boxes, papers, clothing, garbage, etc.) are not stored within the immediate work area (next to and underneath soldering), or any such material within the area has been adequately protected by guarding/shielding.			
Where soldering/other hot work is performed near combustible structural members, those members are adequately free of combustible debris and are adequately protected by guarding/shielding.			
Where soldering is performed near flammable/combustible liquids, a 15 foot clearance is observed. Do not perform any hot work if odor associated with fuel storage or natural gas is detectable.			

**If a permit is required, proceed to bottom of page. If all conditions are either met or not applicable, proceed with soldering or other hot work activities without a hot work permit, and sign here:**

**Name:** \_\_\_\_\_ **Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

### Hot Work Permit Determination For Cutting/Welding/Brazing Activities

Condition	N/A	Condition Met	Condition Not Met—Permit Required
Combustible materials are not stored within 35 feet of the immediate work area, or they are adequately protected by guarding/shielding.			
Floors have been swept clean of combustible debris, and if floors themselves are combustible, they are adequately protected with shielding or wet methods.			
Flammable materials/liquids (or containers that once held flammables) are removed from the work area (35 feet of clearance).			
Adequate natural or mechanical ventilation is provided.			
All wall openings, cracks, floor edges, etc., within 35 feet are tightly covered or otherwise shielded/guarded to prevent the passage of sparks/slag.			
Where hot work is done near walls/partitions/ceilings that are either combustible, or non-combustible yet have combustibles on the other side, adequate precautions have been taken including shielding/guarding/relocation.			
Where hot work is done near a sprinkler head, a wet rag has been laid over the head for the duration of work, and removed when work has been concluded.			
Special precautions have been taken to avoid accidental operation of automatic fire detection systems (isolation, lockout, physical barriers, etc.).			
Nearby containers, vessels, materials or equipment staged within the hot work area are not susceptible to damage by the hot work, and do not present hazards to workers.			

**If a permit is required, proceed to bottom of page. If all conditions are either met or not applicable, proceed with soldering or other hot work activities without a hot work permit, and sign here:**

**Name:** \_\_\_\_\_ **Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**A Hot Work Permit Is Required: Yes  No  Date:** \_\_\_\_\_

**Name:** \_\_\_\_\_ **Signature:** \_\_\_\_\_

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**FORM 4-2  
HOT WORK PERMIT**

**This Permit To Be Posted At Work Site**

<b>Hot Work Basic Information</b>				
Permit Issued To:	Supervisor Authorizing Work:	Date:		
Building/Room:	Area Equipment To Be Used:			
Special Work To Be Done:	Permit Duration	Date:	Time:	
		Date:	Time:	
Please Check Appropriate Response		YES	NO	N/A
1. Has affected personnel been briefed on job safety & requirements?				
2. Has equipment been properly prepared for this work?				
3. Does other work or processes affect this work?				
4. Have fire detection and/or suppression systems been isolated? List below.				
5. Is the work area clean and ready for work to begin?				
6. Has fire watch been assigned with appropriate equipment? Name(s) below:				
Fire Watch 1 Name: _____ Signature: _____				
Fire Watch 2 Name: _____ Signature: _____				
Special Work Requirements (list precautions taken on fire detection/suppression systems): _____ _____ _____				
<b>Hot Work Permit Termination Information</b>				
Job Completed Without Incident? Yes <input type="checkbox"/> No <input type="checkbox"/>	Date/Time Permit Surrendered: Date: _____ Time: _____	Date/Time Permit Canceled Early: Date: _____ Time: _____		
Any Additional Comments: _____ _____ _____				