

 Portland Community College Portland Community College Health & Safety Manual	Dept: Environmental Health and Safety	
	Topic: Chapter 16: Hot Work Plan	
	Board Policy: B507	Revision Date: October 2024

Authority	PCC Board Policy—B507
	Portland Community College is committed to providing a safe and healthy work and educational environment for our employees, students and visitors.

Summary	This plan establishes requirements that must be adhered to under applicable sections of Oregon OSHA Division 2 and Division 3 for welding, brazing, cutting and other work activities that generate sparks, flames or excessive heat. PCC’s intent is to limit the exposure of its employees to the hazards associated with hot work and establish controls and a hot work permit process to reduce accidents and fire hazards.
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Ref. Doc.	i. Chapter 18 Form 1: Contractor Notification Project Hazard Assessment

I. PURPOSE

The purpose of this Hot Work Plan (the Plan) is to establish procedures that prevent fires from operations involving open flames or the production of heat or sparks, and to protect all PCC employees, students, and contractors who may perform those operations. Hot Work operations subject to the Plan include, but are not limited to, welding, cutting, grinding, soldering, using kilns, and using cooking equipment. The PCC Hot Work Plan applies to all operations performed by PCC employees or contractors which involve the generation of sparks, flames or excessive heat unless otherwise excepted.

II. AUTHORITY

PCC Board Policy B507
OR OSHA Div 2/Q, Welding, Cutting, and Brazing
OR OSHA Div 3/J Welding and Cutting
NFPA 51B, Fire Prevention During Welding, Cutting and Other Hot Work

III. RESPONSIBILITY

A. Department Managers - are responsible for:

- Identifying those employees who are authorized to conduct hot work operations outside of designated areas.
- Developing department specific procedures for routine operations involving hot work in designated areas.
- Completing training and ensuring that authorized employees receive general and/or department specific training on this plan prior to completing any hot work operations.
- Ensuring that all authorized employees understand and comply with the procedures in this Plan.
- Serving as a Permit Authorizing Individual (PAI) and conducting inspections prior to hot work. (This duty may be delegated to an authorized employee.)
- Assigning authorized employees to serve as Fire Watch personnel
- Coordinating authorized employees to utilize *Form 1: Hot Work Permit* when working with contractors.
- Providing safe storage of compressed gas cylinders (ref. H&SM Ch 27 – *Compressed Gas Safety Plan*)
- Protecting personnel and property from the hazards associated with hot work
- Providing proper ventilation for the health of personnel
- Sending copies of completed, expired, and canceled *Form 1: Hot Work Permits* to EH&S

B. Authorized Employees - are responsible for:

- Completing general and/or department specific training on this topic prior to performing hot work in non-designated areas.
- Obtaining approval of the Permit Authorizing Individual prior to starting hot work operations in non-designated areas
- Notifying Public Safety 1 hour prior to the start of hot work work in non-designated areas and after the required fire watch period has ended.
- Serving in the capacity of a PAI (if delegated) or as Fire Watch
- Using equipment safely
- Alerting near by employees of hot work operations in their work areas
- Following the procedures laid out in Section IV of this Plan
- Returning *Form 1: Hot Work Permits* to the PAI upon completion of work.

C. Environmental Health & Safety (EH&S) - are responsible for:

- Providing subject matter expertise on hot work operations at PCC
- Periodically reviewing and updating this *Hot Work Plan*
- Receiving copies of completed, canceled, and expired permits.
- Periodically reviewing canceled permits to identify opportunities for improvement of this Plan.
- Developing and facilitating general safety training to personnel performing hot work in non-designated areas.

D. Project Managers - are responsible for:

- Ensuring that Ch 18 Form 1 has been reviewed and completed and contractors understand their responsibilities regarding this Plan
- Coordinating all hot work activities that a contractor performs while on PCC property or involves both PCC employees and contractors
- Consulting with Facilities Management Services if there is concern that control measures are inadequate or otherwise unacceptable
- Ensuring Contractors know to notify Public Safety 1 hour prior to the start of work involving a *Form 1: Hot Work Permit* and after the required fire watch period has ended

E. Facilities Management Services - is responsible for:

- Addressing questions regarding heat detection and/or fire suppression system status and availability.

F. Public Safety - is responsible for:

- Receiving calls at least 60 minutes in advance from authorized personnel regarding hot work operations in non-designated areas and upon completion of such work

IV. PROCEDURES

This section outlines safety procedures applicable to any hot work operation (regardless of location) and any activity with the potential to produce ignition, excess heat, or sparks.

A. General Safety and Associated Hazards

Hot work is usually defined as work that involves any open flame, spark or heat producing activity. This Plan covers work activities associated with typical hot work tasks such as welding, cutting, burning, brazing, grinding, soldering, or torch applied roofing. It also covers activities associated with equipment that has an ignition source or produces excess heat, including but not limited to kilns, weed control, barbecues and other cooking equipment.

Failure to comply with hot work requirements is a leading cause of occupational fires. This Plan outlines the hazards associated with hot work, use of the *Form 1: Hot Work Permit* process, and the requirements of a fire watch.

1. Prohibited Hot Work Areas/Activities

Hot work may not be performed under the following circumstances:

- In areas not authorized by FMS and/or Planning and Capital Construction (P&CC);
- When buildings fire safety systems are impaired or when fire safety systems do not exist in buildings;

- In the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts in air);
- In the immediate area of combustible materials;
- On used drums, barrels, tanks or other containers unless they are thoroughly cleaned – no flammable materials or residues present inside or on the exterior ;
- On pipes that are in contact with combustible materials; and
- On any surfaces that contain zinc, mercury, lead, beryllium, cadmium, asbestos, or other materials that create toxic fumes, dusts, or particulates

2. Non-Designated Area / Equipment Inspections

The following should be inspected prior to beginning hot work requiring a permit:

- All combustible materials including paper, wood, dust, lint, oily deposits, and chemicals should be removed from within a 35-foot clearance zone of the surrounding hot work area;
- Protect the area with approved welding pads, blankets, fire-resistant tarps, or metal shields;
- All wall and floor openings should be covered, or closed;
- Check that sprinklers, charged hoses and extinguishers are in service and operable;
- Loose clothing should be tucked, dangling jewelry removed, and long hair should be tied back and kept away from moving equipment, or sources of heat, sparks, or flame;
- All personnel in the immediate area, not involved with the hot work operation, should be notified of the operation;
- Sources of heat, sparks or flame should never be left unattended;
- Verify gas/fuel supplies can be shut off

B. Designated Hot Work Areas

A designated hot work area is a permanent location designed for hot work. These areas do not require *Form 1: Hot Work Permit* to perform hot work. Examples of designated hot work areas include commercial or instructional kitchens, welding shops, art studios using kilns, laboratories using Bunsen burners and shops/labs equipped with small electric soldering stations. Designated hot work area shall be:

- Non-combustible, of fire-resistive construction, essentially free of combustibles and flammables
- The working surface for the use of soldering and brazing activities should be of a non-combustible material (e.g., laboratory bench top, duraboard, tile, etc.)
- Suitably segregated from adjacent areas
- Equipped with fire extinguisher(s) or other fire suppression equipment
- Equipped with a heat detector rather than a smoke detector
- Equipped with mechanical ventilation to control smoke and fumes
- Inspected and approved by FMS

1. General Welding Safety:

Any employee or contractor who performs welding or other hot work operations must be trained in the operating procedures for the equipment used, knowledge of hazards associated with the use of the equipment, and which personal protective equipment (PPE) is appropriate for the activity being performed. Employees must follow manufacturer specifications for equipment as well as the following general guidelines.

- Flammable and other potentially hazardous materials should be cleaned from surfaces before welding is started
- If the objects to be welded cannot be moved to a safe location, all movable hazardous materials should be removed to a safe location and a *Form 1: Hot Work Permit* must be initiated. Comply with applicable requirements of Section IV.A.2 of this Plan and *Form 1: Hot Work Permit*.
- Fire protection equipment should be kept immediately at hand and ready for use
- Adequately ventilate the area to prevent accumulation of toxic fumes and gases. Respiratory protection may be necessary if ventilation is not sufficient (Refer to Chapter 17 of the H&SM – *Respiratory Protection*)
- Do not stand in water or have equipment or other tools or PPE placed in water while welding
- If welding must be done in a confined space, the procedures in Chapter 5 of the H&SM - *Confined Space Entry and Tunnel Safety* must also be followed
- Appropriate PPE for welding must be worn:
 - Cover skin and body to prevent burns. Use flameproof, heat insulating materials for covers and gloves
 - Wear a welder's helmet to protect the eyes and face against the glare and radiation from a welding arc or flame
 - Other personnel in the vicinity of welding operations may need to wear protection

Gas cylinders must be handled carefully (breaking the neck from a full cylinder can turn the bottle into a missile). Cylinders shall be secured to keep them from falling. Acetylene cylinders must always be maintained in an upright position. Oxygen cylinders should be separated from fuel-gas cylinders or other combustible materials by at least 20 feet or by a fire-resistant barrier at least 5 feet in height, when the combination of gases is not in use. Add reference to Ch 27.

2. Kiln Safety

- Installation of all kilns must adhere strictly to all fire codes. All gas and electrical connections / hookups can only be performed by professionals. All kilns must be properly grounded
- Kiln firing should be performed by a person with experience and thorough knowledge of kiln functions and controls
- Kilns wired for 3-phase electrical may still allow electricity to run through the elements when the kiln sitter timer is off. Additional caution should be taken. Do not reach into an electric kiln unless all switches are off
- Prior to vacuuming or inserting any electrical conductor into the kiln, ensure it is off or unplugged or both
- If the burners blow out, shut down all burner systems and wait ten minutes before attempting re-ignition. This prevents ignition of a potentially explosive atmosphere within the kiln
- If there is a gas, odor, or visible smoke while the kiln is off, evacuate immediately and call Public Safety at (971) 722-4444
- Additional considerations:
 - Firing clay materials in electric and gas kilns produces carbon monoxide, formaldehyde, and sulfur dioxide gases. Firing glazes in electric and gas kilns can produce fumes of crystalline silica and other toxic materials. Use appropriate engineering or administrative controls to prevent respiration of such dusts or fumes. Contact EH&S if assistance is needed to evaluate these hazards.

2. Bunsen Burners Used in Laboratories:

Laboratories using Bunsen burners are considered designated areas under OSHA. However, due to the presence of flame, the applicable safety procedures outlined in Section IV.A.2 of this Plan should always be followed. Always ensure gas sources are turned off when equipment is not in use.

3. Small Electric Soldering Stations:

- Never touch the element or tip of the soldering iron
- Wear eye protection
- Ensure adequate ventilation is present
- Hold wires to be heated with tweezers or clamps
- Keep the cleaning sponge wet during use
- Always return the soldering iron to its stand when not in use. Never put it down on a workbench
- Turn unit off or unplug it when not in use

C. Non-Designated Work Areas

Any area outside of a designated hot work area is considered a non-designated hot work area. *Form 1: Hot Work Permit* must be initiated prior to performing hot work in any non-designated areas.

Prior to authorizing hot work in a non-designated area, the area must be inspected visually in accordance with the criteria listed in Section IV.A.2 of this Plan to ensure it is free of fire hazards. The following activities occurring in non-designated work areas will require *Form 1: Hot Work Permit*:

1. Welding, cutting, soldering or other hot work operations for repairs or other maintenance.

Whenever these operations are performed outside of established designated areas, a PAI must inspect the work area in accordance with the criteria listed in Section IV. A. 2 of this Plan and the applicable safety and fire considerations listed in Sections IV. B. 1 and IV. B. 3 of this Plan.

2. Barbecuing or grilling.

Grilling or barbecuing outside of a commercial or instructional kitchen will require a *Form 1: Hot Work Permit*. In addition, the following best management practices for safeguarding against fire hazards must be adhered to:

- All grilling or barbecuing must occur outdoors and at least 20 feet from any buildings
- Areas in which grilling, barbecuing or other open flame cooking will occur must be clear of combustible materials for at least 20 feet in all directions
- A suitable fire extinguisher must be kept nearby for easy access in the event of an unexpected fire. Do not use fire extinguishers designated for locations inside a building. Contact FMS to borrow fire extinguishers for the event.
- The disposal of hot coals in trash cans or dumpsters is prohibited. Hot coals should be allowed to cool completely before disposing of them.
- All equipment is to be closely monitored until it has completely cooled. Never leave hot equipment or open flames unattended.

3. Academic demonstration events conducted outside of laboratories or studios.

Academic demonstrations involving the generation of heat, spark, or flame outside of

a laboratory or studio setting will require a *Form 1: Hot Work Permit*. The following best management practices for safeguarding against fire hazards must be adhered to:

- The area will be inspected, and adjustments made to comply with the applicable elements of Section IV A.2 of this Plan
- All demonstrations must occur outdoors and at least 20 feet from any building
- Areas in which demonstrations will occur must be clear of combustible materials for at least 20 feet in all directions
- A suitable fire extinguisher must be kept nearby for easy access in the event of an unexpected fire. Do not use fire extinguishers designated for locations inside a building. Contact FMS to borrow fire extinguishers for the event.
- All equipment is to be closely monitored until it has completely cooled. Never leave hot equipment or open flames unattended.

4. Exceptions to Hot Work Activities in Non-Designated Areas

The following do not require completion of *Form 1: Hot Work Permit*.

a. Dining Services Catering Requests

Lighting and maintaining containers of Sterno®, Liquid Heat® or other chafing dish fuels supplied by Food Service Operations personnel in support of Catering Requests are excepted from the *Form 1: Hot Work Permit* process, and the personnel and paperwork requirements described in this Plan. The event host and/or participants are responsible for ensuring that open flames used in conjunction with chafing dishes and other heating devices are extinguished prior to ending their event. Neither Food Services Operations personnel nor event hosts and participants are subject to the training requirements of this Plan in so far as chafing dish warming devices are concerned.

b. Propane Barbeques and/or Grills

Grills and/or barbecues fueled by propane are excepted from *Form 1: Hot Work Permit* requirements, provided they are located on a concrete or asphalt surface and the applicable requirements in Section IV.A.2 of this Plan are followed.

c. Weed Control Using Propane Torches

Using propane torches for weed control is excepted from *Form 1: Hot Work Permit* requirements when conducted outside of local recognized fire seasons, away from buildings and combustible materials, and the applicable requirements in Section IV.A.2 of this Plan are followed.

D. Hot Work Permit Process

Form 1: Hot Work Permits may be issued only by a trained PAI and must be used for all hot work operations done outside of designated hot work areas.

- Complete *Form 1: Hot Work Permit* checklist associated with *Form 1: Hot Work Permit* before issuing the permit
- Obtain signature of supervisor functioning as a PAI
- Display *Form 1: Hot Work Permit* in a highly visible location at the job site during the hot work operations
- *Form 1: Hot Work Permit* is to be returned to the PAI who issued the permit
- In the event of a change of shifts, it is the responsibility of the PAI who issued the permit to notify the next shift's manager that a permit was issued and will need to be picked up
- If a *Form 1: Hot Work Permit* is issued for an unstaffed area of the worksite, notify

the next shift manager so that they can monitor the area during the 4 hours after the work is completed

All completed, cancelled, and expired permits must be returned to the PAI for proper record keeping. A copy of the permits must also be provided to EH&S for review and to identify opportunities for improvement of this Plan.

E. Personnel Duties

1. Permit Authorizing Individual
 - Completing all required training to perform, delegate hot work, or sign a *Form 1: Hot Work Permit*
 - Inspect work area before hot work operations begin
 - Complete and sign *Form 1: Hot Work Permit(s)*
 - Receive completed permits once work and fire watch are complete
2. Hot Work Operator
 - Completing all required training to perform hot work operations
 - Receiving the completed and signed *Form 1: Hot Work Permit* from the PAI.
 - Posting the permit at the work location.
 - Alerting nearby employees of the hot work to be performed in the area
 - Ensuring a fire extinguisher is located near to hot work location
 - Using appropriate PPE while performing hot work
 - Immediately stopping all hot work should unsafe conditions arise
 - Being familiar with the facility's procedures for sounding an alarm and activating the facility alarm if a fire starts
 - Returning *Form 1: Hot Work Permit* to the issuing PAI when hot work is complete
3. Fire Watch
 - Completing all required training, including training on this procedure and fire extinguishers
 - Alerting nearby employees of hot work activities
 - Ensuring safe work practices are maintained after hot work operations
 - Ensuring a fire extinguisher remains readily available during the fire watch
 - Being familiar with the facility's procedures for sounding an alarm and activating the facility alarm if a fire starts
 - Maintaining a continuous fire watch for one hour after hot work is completed. After the required 1-hour period, the area should be periodically monitored for an additional 3 hours if conditions warrant. The additional 3 hours does not require a person to stay at the location but can be accomplished through use of an automatic fire alarm where present, or by periodically monitoring the area.

F. Contractor Procedures

Project Managers should work with Contractors to review projects and determine which, if any, tasks will involve hot work operations. This information will be documented using *Chapter 18 Form 1: Contractor Notification Project Hazard Assessment*.

All hot work operations are subject to the requirements of this Plan as well as the Contractor's hot work procedures. This includes the completion of both *Form 1: Hot Work Permit* and the Contractor's internal permitting process, as well as contacting Public Safety 1 hour prior to the start of work involving a *Form 1: Hot Work Permit* and after the required fire watch period has ended.

Project Managers will consult with FMS if there is concern that PCC provided control measures are inadequate or otherwise unacceptable. Contractors must submit copies of all completed, expired, or canceled permits to the Project Manager for record keeping in the project folder.

V. TRAINING

A. General Training

EH&S is responsible for the development of a training curriculum for personnel performing hot work in non-designated areas in accordance with the requirements and procedures included in this Plan.

The general training course will cover:

- designated vs non-designated areas
- personnel duties
- permit procedures

The repository of training materials and the delivery system for such materials will be PCC's Learning Management System (MyCareer@PCC).

B. Department-Specific Training

Training for personnel working in designated areas will be conducted by the department that occupies/uses the space in which the designated area(s) exist(s).

C. Retraining

Retraining will be conducted if there is a change to hot work operations safety procedures or to the *Hot Work Permit* process, or if it becomes apparent that there are gaps in an employee's knowledge.

VI. RECORDKEEPING

A. Training Records

Departments conducting work in designated hot work areas will maintain training records for the personnel that work within those areas.

Training records for personnel conducting hot work in non-designated areas will be maintained in PCC's Learning Management System known as Cornerstone, which is located at MyCareer@PCC.

B. Completed, Expired, and Canceled Hot Work Permits

Completed, expired, and canceled *Form 1: Hot Work Permits* should be maintained by the department issuing them for one year. A copy of these permits will be provided to EH&S for periodic review.