Portland Community College Health & Safety Manual	Dept: **Environmental Health and Safety (EH&S)**	
	Function: **Facilities Management Services**	
	Topic: **Chapter 16: Hot Work Plan**	
	Board Policy: B507 Effective Date: May 2004	Revision Date: **December 2020**

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 procedure 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.**

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, use of Bunsen burners, kilns and 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.

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:

- Identifying which employees are authorized to conduct hot work operations
- Ensuring that all authorized employees understand and comply with the procedures in this Plan
- Ensuring that authorized employees receive training on these procedures prior to issuing any Hot Work Permits
- Serving as a Permit Authorizing Individual (PAI) and conducting hot work inspection
- Assigning authorized employees to serve as Fire Watch personnel
- Coordinating authorized employees to utilize the hot work permit when working together with contractors in the area
- Assessing for fire potential and explosion prevention prior to initiating hot work
- Providing safe storage of compressed gas cylinders
- Protecting personnel from the hazards associated with hot work
- Providing proper ventilation for the health of personnel
- Delegating the aforementioned responsibilities to properly trained authorized employees

B. Authorized Employees - PCC employees who will perform hot work operations, act as a fire watch, or serve as a PAI, or oversee contractors performing hot work, are responsible for:

- Completing training in this procedure
- Obtaining approval of Facilities Management Services (FMS) and EH&S prior to starting hot work operations in non-designated areas
- Notifying Public Safety 1 hour prior to the start of work involving a Hot Work Permit and after the required Fire Watch period has ended
- Using equipment safely
- Alerting other employees of hot work operations requiring a permit

- Following the procedures laid out in Section IV.

C. Environmental Health & Safety (EH&S):

- Providing subject matter expertise on hot work operations at PCC
- Periodically reviewing and updating this *Hot Work Plan*
- Approving hot work permits
- Periodically reviewing cancelled hot work permits to determine if there are any deficiencies that need correction
- Providing safety training to personnel performing hot work in non-designated areas

D. Project Managers

- Coordinating all hot work activities that involve both PCC employees and contractors
- Reviewing the Contractor's Hot Work Program and ensuring that contractors understand their responsibilities as outlined in this Plan
- Consulting with EH&S if there is concern that control measures are inadequate or otherwise unacceptable

E. Contractors

- Following all applicable regulations regarding hot work
- Following specific requirements set forth by their own Hot Work program
- Following the safety procedures of this Plan and other applicable plans, programs, protocols, etc.

F. Public Safety

- 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 potential to produce ignition, excess heat, or sparks.

A. General Safety and Associated Hazards

Hot work is usually defined as any open flame, spark or heat producing activity. This Plan covers any 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, barbecues, and Bunsen burners.
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 a hot work permitting system, and the requirements of a fire watch. A job safety briefing with all crew members should be held for all hot work activities or operations.

1. Prohibited Hot Work Areas/Activities - Hot work may not be performed under the following circumstances:

    - In areas not authorized by Facility Management Services (FMS) and/or EH&S
    - When buildings equipped with 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
    - On any surfaces that contain zinc, mercury, lead, beryllium, cadmium, asbestos, or other materials that create toxic fumes, dusts, or particulates

2. Area / Equipment Inspections - The following should be inspected prior to beginning hot work:

    - All combustible materials including paper, wood, dust, lint, oily deposits, and chemicals should be removed (35-foot clearance) from 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 not 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 a 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 (i.e. laboratory bench top, duraboard, tile, etc.)
- Suitably segregated from adjacent areas

- Equipped with fire extinguisher(s)
- Equipped with a heat detector rather than a smoke detector

- Equipped with mechanical ventilation to control smoke and fumes
- Inspected and approved by FMS and/or EH&S

1. 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 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 of clay materials in electric and gas kilns produces carbon monoxide, formaldehyde, and sulfur dioxide gases. Firing of glaze materials 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 assistance is needed to evaluate these hazards.

2. Bunsen Burners Used in Laboratories:
   Bunsen burners used within designated areas of laboratories are exempt from Hot Work under OSHA. However, due to the presence of flame, the safety procedures outlined in Section A. 2 of this Plan should always be followed.

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
    - Wash hands with soap and water after soldering is complete

4. 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. This section provides general safety precautions for welding. Manufacturer specifications for equipment must also be followed.

- 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 Hot Work Permit must be obtained. See Section A-2 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 gasses is 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. A Hot Work Permit must be obtained 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. B.2 of this Plan to ensure it is free of fire hazards. The following activities can occur in non-designated work areas and require a hot work permit:

- Welding, cutting, soldering or other hot work operations for repairs or other maintenance
- Barbecuing or grilling
- Demonstration events using Bunsen burners

1. Hot Work Permit Process

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

   - Complete the Hot Work Permit checklist before issuing the hot work permit (see Form 1: *Hot Work Permit* for detailed instructions)
   - Obtain signature of supervisor functioning as a Permit Authorizing Individual (PAI)
   - Provide a copy of the completed Hot Work Permit to Facilities Management Services or EH&S for review
   - Display the Hot Work Permit in a highly visible location at the job site during the hot work operations
   - The Hot Work Permit is to be returned to the supervisor who issued the permit no more than 4 hours after the work is completed
   - In the event of a change of shifts, it is the responsibility of the supervisor who issued the permit to notify the next shift's supervisor that a permit was issued and will need to be picked up
   - If a Hot Work Permit is issued for an unstaffed area of the worksite, notify the next shift supervisor so that they can monitor the area during the 4 hours after the work is completed
   - All cancelled Hot Work Permits are to be turned into the supervisors' office after the final check has been completed

2. Duties

   a. Hot Work Operator / PAI

   - Completing all required training to perform, supervise, delegate hot work or sign a Hot Work Permit
   - Ensuring a fire extinguisher is located near to hot work location
   - Obtaining and completing a hot work permit as needed
   - Submitting the completed hot work permit to Facilities Management Services and EH&S for approval
   - Posting the hot work permit at the work location.
   - Alerting affected employees of the hot work to be performed in the area
   - Using appropriate PPE while performing hot work
   - Immediately stopping all hot work should unsafe conditions arise
   - Returning the hot work permit to the issuing supervisor when hot work is complete

   b. Fire Watch

   - Completing all required training to perform the duties of a Fire Watch, including training on this procedure and fire extinguisher training
   - Alerting affected employees of hot work activities

- Ensuring safe work practices are maintained during hot work operations
- Stopping work if the hot work operations become unsafe
- Having a fire extinguisher readily available
- Being familiar with the facility's procedures for sounding an alarm
- Activating the facility alarm if a fire starts
- Maintaining fire watch for one hour after hot work is completed. After the required 1 hour period, the area may be 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.

3. Barbeque or Grill Safety

   Grilling or barbecuing outside of a commercial or instructional kitchen will require a 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
   - Ensure that areas in which grilling, barbecuing or other open flame cooking will occur are clear of combustible materials for at least 20 feet
   - Ensure that a fire extinguisher is kept nearby for easy access in the event of an unexpected fire. Do not use fire extinguisher designated for locations inside a building. Contact FMS to borrow fire extinguishers for the event
   - Do not dispose of hot coals in trash cans or dumpsters. Allow them to cool completely and before disposing of them
   - Monitor all equipment until completely cooled. Never leave equipment or open flame unattended

4. Bunsen Burner Safety in Non-Designated Areas

   While use of Bunsen burners in laboratories does not require a Hot Work Permit, any event involving one outside of a laboratory must have a Hot Work Permit form completed and approved prior to the start of the event. Please submit the Permit form to EH&S at SY CSB 207 for approval. During events in which Bunsen burners are used in non-designated areas, the following safety procedures must be followed:

   - Place Bunsen burner at least 6 feet from overhead shelving and at least 2 feet from:
     - Light fixtures
     - Combustible materials such as paper, cardboard, or flammable chemicals
   - Inspect burner, hoses, and valves for cracks or other defects prior to connecting to gas and turning on
   - Use a sparker lighter or other approved Bunsen burner igniting method. Have the lighter in hand prior to turning on gas
   - If there is significant gas odor, or a fire, immediately evacuate the area and call Public Safety at (971) 722-4444

- Turn off the burner and the gas valve as soon as the demonstration is complete
- Never leave the area while an open flame is present or when or the gas valve is still open
- Let the Bunsen burner cool before handling

5. Welding & Soldering – Whenever these operations are performed outside of established designated areas, authorized personnel must inspect the work area in accordance with the criteria listed in Section IV. B. 2 of this Plan and the applicable safety and fire considerations listed in Sections IV. B. 3 and IV. B. 4 of this Plan.

V. TRAINING

Employees will be informed in New Employee Safety Orientation of the general prohibition on hot work in non-designated areas and that all hot work in such areas requires additional training.

Training for personnel working in designated area, e.g., commercial and instruction kitchens, Welding Shops, etc. will be conducted by the department that occupies/uses the space in which the designated area(s) exist(s).

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

Employees in the following departments will also receive specific training on the PCC *Hot Work* Permit Plan due to the likelihood that they will conduct or oversee hot work operations in non-designated areas:

- FMS Maintenance personnel
- FMS Project Managers
- Planning & Capital Construction Project Managers
- Any PCC employees performing hot work in non-designated areas, including but not limited to:

    - Dining Services
    - Welding
    - Science
    - Art

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 operating 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. Cancelled Hot Work Permits

Cancelled Hot Work Permits should be maintained the department issuing them for one year.

EH&S will review cancelled Hot Work Permits annually to determine if:

- The hot work procedures in this Plan are adequate
- Authorized employees know their responsibilities
- The procedure is being followed in the hot work permit