

University of Portland



HOT WORK SAFETY PROGRAM



UNIVERSITY OF PORTLAND

PORTLAND, OREGON



JUNE 2022



HOT WORK SAFETY PROGRAM

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HOT WORK SAFETY PROGRAM

1.0 INTRODUCTION

Cutting and welding operations (commonly referred to as hot work) are associated with machine shops, maintenance, and construction activities. Potential health, safety, and property hazards result from the fumes, gases, sparks, hot metal and radiant energy produced during hot work. Hot work equipment, which may produce high voltages or utilize compressed gases, also requires special awareness and training on the part of the worker to be used safely. The hazards associated with hot work at University of Portland can be reduced through the implementation of effective control programs.

The University of Portland is dedicated to the safety of the community, including staff, faculty, and students. All University employees and contractors working under University supervision shall comply with the elements of this policy. This policy is intended to ensure proper communication and decision-making within the Physical Plant for hot work operation due to maintenance or emergency requirements. The authority governing hot work at the University of Portland is Oregon OSHA Standard 1910.252-1910.254.

2.0 PURPOSE AND SCOPE

This program establishes the minimum requirements for Hot Work in order to protect University of Portland employees. University of Portland *prohibits* cutting and welding operations unless appropriate steps are taken to minimize fire hazards, such as removal or guarding of combustible materials and, when possible, restricting hot work to specially designated areas. Departments where hot work is performed are responsible for ensuring that adequate controls and procedures are in place before work begins.

3.0 RESPONSIBILITY

All employees of University of Portland are required to comply with the restrictions and limitations of this program. Only *Authorized Employees* are required to perform Hot Work in strict accordance with this program. All contractors (including non-University personnel) must follow the guidelines set forth in this policy.

All University of Portland employees conducting Hot Work must be authorized and trained to do so and must comply with all necessary precautions and work practices.

4.0 APPLICATION

Hot work coverage includes:

- Welding
- Brazing

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- Soldering
- Heat treating
- Grinding
- Power-actuated tools
- Hot riveting
- Similar applications producing a spark, flame, or heat.

Hot work coverage does not include the use of:

- Candles
- Laboratory activities
- Pyrotechnics or special effects
- Cooking
- Soldering irons
- Torch-applied roofing (see NFPA 241)

5.0 GENERAL CUTTING AND WELDING CONTROLS

Areas where hot work is done should be properly designated and prepared. Combustible and flammable materials within the work area should be protected against fire hazards and the operation should not pose a hazard to others in nearby areas. To help achieve this, the following controls should be used:

- Cutting and welding operations restricted to authorized, properly trained individuals
- If possible, hot work performed in a properly designed shop area equipped with all necessary controls and adequate ventilation
- Move combustible materials at least 35 feet from the work site. If this is not possible, protect combustible materials with metal guards or by flameproof curtains or covers (other than ordinary tarpaulins)
- Cover floor and wall openings within 35 feet of the work site to prevent hot sparks from entering walls or falling beneath floors or to a lower level
- Fire resistant curtains and /or tinted shields used to prevent fire, employee burns, and ultra-violet light exposure.

Personal Protective Equipment

Personal protective equipment specifically designed for hot work should be provided to and used by workers. The potential for toxic fume emissions from the material being worked on or surface coatings should be considered and appropriate steps should be taken to provide for respiratory protection.

Cutting and Welding in Confined Spaces

When cutting or welding is to be done in confined spaces, appropriate entry procedures should be followed.



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Compressed Gas Cylinder Storage and Handling

Storage and handling of compressed gas cylinders are important parts of many cutting and welding operations. The following should be observed:

Oxygen and fuel gas cylinders should be stored separately with the protective valve caps in place. Except when in use, oxygen and fuel gas cylinders should be stored at least 20 feet apart or separated by a noncombustible wall at least 5 feet high;

- Cylinder carts equipped with a cylinder restraint, such as a chain or strap, should be used for all transporting of compressed gas cylinders;
- Cylinders should be secured from tipping, in an upright position;
- Regulators must be compatible with the cylinder and its contents. Many regulators are similar in design and construction. Check the regulator's model number and compare that with the cylinder's requirements.



Ventilation and Atmospheric Testing

Hot work should not be conducted in the presence of explosive mixtures of flammable gases, vapors, liquids, or dusts or where explosive mixtures could develop inside improperly prepared tanks or equipment. If there are concerns of flammable gases, vapors, liquids, or dusts, contact Environmental Health and Safety. Atmospheric testing and monitoring for combustible gases and vapors should be done before work begins and at regular, predetermined intervals thereafter. Ventilation of the work site, either through local or general exhaust ventilation, should be adequate for the work performed.

6.0 FIRE WATCH PROCESS

The purpose of a fire watch is to serve as temporary 'human smoke detectors' and to notify building occupants at the first sign of smoke or fire. The person assigned to a fire watch should be equipped with a phone or two-way radio to notify Campus Safety if a fire and/or smoke has been detected. A fire watch is conducted when a building's fire system is down, or during risky activities such as hot work (welding and cutting). The requirement of a fire watch shall be determined by the kind of hot work being performed and the circumstances under which the hot work is executed. A fire watch, when warranted, shall be provided during and for the entire 30-minutes after the hot work operation and then again when a four-hour period has passed since the hot work was executed. The Hot Work Supervisor will determine if a fire watch is necessary and notify the Hot Work Operator as well as Campus Safety and Environmental Health and Safety. When a fire watch is not required, the Hot Work Supervisor or Hot Work Operator must make a final inspection of the area 30 minutes after the completion of the hot work operations to detect for and potential fires or smoldering embers.

A fire watch can be performed by any combination of Campus Safety, Physical Plant, Environmental Health and Safety, or outside contractor personnel who are trained in the use of fire extinguishers and in sounding a fire alarm. During business hours (8am-4:30pm) Physical Plant staff will complete the fire watch responsibilities. If the four-hour period falls after business hours Campus Safety should be alerted, and a Campus Safety Officer will perform the fire watch.

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In conjunction with the Hot Work Supervisor, the Hot Work Operator shall establish proper fire-watch procedures when hot work is performed in a location where other than a minor fire might develop where the following conditions exist:

- combustible materials in the building construction or contents are closer than 35 feet to the point of hot work.
- Combustible materials in a building are more than 35 feet away but are determined to ignite easily by sparks.
- Wall or floor openings are within 35 feet and expose combustible materials in adjacent areas, including combustible materials concealed in walls or floors
- Combustible materials are adjacent to the opposite side of partitions, walls, ceilings, or roofs and are likely to be ignited

A fire watch may be required in multiple spaces if combustible materials that could be ignited by hot work operations cannot be directly observed by a single fire watch (such as combustible items that could be impacted in separate rooms).

A person ***other than the operator*** should perform fire watch duties and remain at the work site for at least 30 minutes after hot work operations have ended. Additionally, the following steps should be taken:

- A fire extinguisher rated at not less than 2-A:20-B:C must be available in shop areas where hot work is performed;
- A fire extinguisher rated at not less than 2-A:10-B:C must be attached to all portable cutting and welding carts;
- If a building or area is equipped with a sprinkler system, then that system must be operational when hot work is performed

To Perform a Fire Watch:

- Conduct a continuous patrol of the designated hot work area(s) 30 minutes after hot work is completed and again at the 4 hour mark after hot work completion
- Look for observable signs of smoke, fire, and hazardous conditions
- Enter all stairwells- open doors and look into each stairwell
- Enter all common areas including basements, lounges, laundry rooms, and dining areas

At the first sign of smoke or fire, the fire watch personnel must:

- Pull the nearest fire alarm pull station
- Notify building occupants to evacuate in the event there is no fire alarm pull station
- Small fires may be extinguished using a fire extinguisher
- Exit the building and notify Campus Safety by phone or radio

Fire Extinguisher Training is available to all University of Portland employees via the online training learning platform Moodle. To be enrolled in the training contact Environmental Health and Safety at ehs@up.edu.



7.0 HOT WORK PERMITS

Hot work permits must be used where cutting or welding is performed; authorized personnel (Campus Safety/EHS/Physical Plant supervisor) must sign-off on the permit before Hot Work may begin. Hot work permits help minimize the risk of fire during cutting and welding activities by serving as a checklist for operators and those performing fire watch duties.

The person responsible for issuing permits should be qualified to examine the work site and ensure that appropriate protective steps, such as those listed in this section, have been taken. A hot work permit should be issued at the beginning of each shift for each specific operation.

Hot work operations in confined spaces requires additional safeguards and are addressed in the University of Portland Confined Space Policy and Permit Program. Hot work on or near building systems and piping may require additional safeguards with respect to hazardous energy and are addressed in the University of Portland Lock Out-Tag Out Procedures. All hot work performed by outside contractors shall conform to this written plan and with the National Fire Protection Association Standard 51B (Standard for Fire Prevention During Welding, Cutting, and Other Hot Work).

8.0 RESPONSIBILITIES DURING HOT WORK

Hot Work Supervisor:

The Hot Work Supervisor is responsible for the overall safe operation of hot work activity under his or her supervision. These responsibilities include:

- Establishment of a permissible area for hot work
- Ensure only approved equipment are used (approved torches, manifolds, regulators, pressure valves, etc.)
- Ensure that all individuals involved in hot work operations are familiar with this policy and it's requirements
- Ensure that all individuals involved in hot work are trained in safe operations of their equipment and possible emergency procedures
- Determination of site-specific flammable materials, hazardous processes, or other potential fire hazards present, or likely to be present, in the work location.
- Determine if a fire watch is necessary and ensure the hot work area is monitored via the fire watch for four hours after the work is completed, if necessary
- Notify Campus Safety and Environmental Health and Safety of the hot work operation.

The hot work supervisor may be the shop supervisor, the Assistant Director of Physical Plant, the Director of Physical Plant, or the Office Manager of Physical Plant.

Hot Work Operator:

The Hot Work Operator is responsible for operating equipment safely and performing work safely and in accordance with this policy to ensure safe operation of hot work activity under his/her control. The Hot Work Operator must have written authorization from the Hot Work Supervisor to perform hot work. The Hot Work Operator must immediately cease hot work operation if unsafe conditions develop or if requested to do so by the Hot Work Supervisor, Environmental Health and Safety, or Campus Safety. If unsafe conditions develop the Hot Work Supervisor and Campus Safety should be notified immediately.

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Responsibilities include:

- Ensuring combustibles are protected from ignition by moving the work to a location free of combustibles or if work cannot be moved to a location free of combustibles ensure that combustibles are moved to a safe distance or properly shielded against ignition.
- Ensure that hot work is scheduled such that operations that could expose flammables or combustibles to ignition do not occur during hot work operations
- Ensure that fire protection and extinguishing equipment are properly located and readily available while performing hot work

Fire Watch Personnel:

A fire watch can be performed by any combination of Campus Safety, Physical Plant, Environmental Health and Safety, or outside contractor personnel who are trained in the use of fire extinguishers and in sounding a fire alarm. The Hot Work Supervisor will determine if a fire watch is necessary and notify the Hot Work Operator as well as Campus Safety and Environmental Health and Safety. If a fire watch is required, the fire watch personnel will monitor the area for continuously for 30 minutes after hot work operation, and then repeatedly for four hours.

9.0 TRAINING

All persons performing hot work should be trained in proper equipment operation, handling and storage of welding materials, compressed gas safety, chemical hazards, and in working procedures, including the written hot work permit. Additional training may also be necessary in the proper selection and use of personal protective equipment. Training in confined space entry is necessary before performing hot work in confined space areas.

All staff involved in the fire watch process must complete the online Fire Extinguisher Safety training course.



Appendix A



Hot Work Safety Guidelines

General Guide to the Completing the University of Portland Hot Work Checklist

1. Welding and cutting operations should be restricted to workers who have been properly trained.
2. Hot Work Permits are required for all welding and cutting operations. Permits are obtained from the main Physical Plant office and must be taken to Campus Safety for sign off before beginning the hot work, and emailed to EHS after completion.
3. Whenever possible, hot work should be performed in a properly designed shop area equipped with all necessary controls and adequate ventilation.
4. Combustible materials, such as building construction materials or other building contents, must be located at least 35 feet from the hot work area or properly protected to prevent hot sparks from contacting them. Floors within this area must also be swept clean of all combustible materials.
5. All openings in floors and wall within 35 feet of the hot work area must be covered to prevent hot sparks from entering walls or falling beneath floors or to a lower level.
6. Hot work should not be conducted in the presence of explosive mixtures of flammable gases, vapors, liquids, or dusts or where explosive mixtures could develop inside improperly prepared tanks or equipment. If there is concern of the presence of flammable gases, vapors, liquids, or dusts EHS should be notified and atmospheric testing and monitoring for combustible gases and vapors should be conducted before work begins and at predetermined intervals thereafter.
7. Fire resistant curtains and tinted shields should be used to prevent fire, employee burns, and ultra-violet light exposure.
8. Personal protective equipment specifically designed for hot work should be provided to and used by workers. The potential for material being worked on or surface coatings to emit toxic fumes should be considered.
9. A fire extinguisher rated at not less than 2-A:20-B:C must be available in shop areas where hot work is performed. A fire extinguisher rated at not less than 2-A:10-B:C must be attached to all portable welding carts.
10. The building's sprinkler system, if so equipped, must be operational before hot work can begin.
11. A person other than the operator should perform fire watch duties and should remain at the worksite for at least 30 minutes after hot work operations have ended. This could be a Campus Safety Officer, Hot Work Supervisor, or Environmental Health and Safety.

Appendix B. Welding and Cutting (Hot Work) Operations Checklist

Building/Area _____ Room _____ Supervisor _____ Date _____

Checklist Completed by _____

	Y	N	NA	COMMENTS
A. General Welding and Cutting Controls				
1. Welding and cutting operations restricted to authorized employees				
2. Hot Work Fire Code Permit obtained				
3. Hot work performed in a shop area, if possible				
4. Combustible materials moved at least 35 feet from worksite				
5. Floor and wall openings covered at least 35 feet from worksite				
6. Procedures developed to prevent welding and cutting in the presence of explosive or toxic air contaminants				
7. Fire resistant curtains and/or tinted shields provided				
8. Local or general exhaust ventilation adequately used				
9. Appropriate personal protective equipment provided and used				
10. Appropriate fire extinguishers provided in vicinity of hot work				
11. Building sprinkler systems operational, when applicable				
12. Procedures developed to establish and maintain a fire watch in hot work areas				
13. Hot work permit used				

Continued....

	Y	N	NA	COMMENTS
B. Welding or Cutting in Confined Spaces				
1. Procedures developed for confined space entry and rescue				
2. Ventilation and/or respiratory protection provided				
3. Welding and cutting equipment left outside space				
4. Electrodes removed from holders and/or gas supply shut off when operations are suspended for any substantial period				
5. Hot work permit used				
C. Compressed Gas Cylinders				
1. Oxygen and fuel gas cylinders stored separately with protective valve caps in place				
2. Regulators compatible with gas cylinder				
3. Cylinder carts used for transport				
4. Cylinders secured from tipping while in use				
5. Empty or unused gas cylinders promptly returned to supplier				
D. Training				
1. Workers trained in use of welding and cutting equipment, material hazards, and control methods				
2. Personal protective equipment training provided				
3. Confined space entry training provided, where necessary				

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Appendix C. Hot Work Permit Checklist

Make sure to complete steps 8A & 8B, the final inspection and scanning the copy to EHS as these are critical parts of safety and our own documentation.

1. Complete Hot Work Permit.

- Hard Copies: Located in Physical Plant Main Office, below mailboxes in upper right drawer.
- Electronic copy:
- P.Plant U: drive > EHS > Hot Work Permits
- *Note: the Permit. No. is 6-digits – the calendar year, -, number found on spreadsheet in U:drive > EHS > Hot Work Permits > [YEAR] ex: "2021-01"

2. Receive signature approval.

- The following roles can sign/approve the permit request: Your Supervisor, Assistant Director, Director, or Office Manager.

3. Deliver or email a copy of the permit to Campus Safety prior to work.

- Communicate any other details they may need to be aware of. Ensure they are aware and do not just drop off the permit. campussafety@up.edu

4. Post original permit copy at your job site.

5. Complete hot work project.

6. Inspect work area.

- Immediately post work to ensure safe and secure.

7. Sign the Original Permit copy posted at the job site.

- Sign with Date and time of completion on the "FIRE WATCH SIGNOFF" line.
- Leave the Original copy with the signature posted.

8. Return to Campus Safety.

- Communicate the work is complete and the actual time the work was completed.
- If the 4-hour final inspection time falls afterhours, ensure Campus Safety is aware so they know what time the 4-hour final inspection is needed.
- Sign their permit copy with date and time, on the "FIRE WATCH SIGNOFF" line.

9. Complete 4-hour final inspection (if during business hours)

- Go to the work site and complete final inspection and ensure the area is safe and that nothing has begun to smolder, developed into a flame, etc.
- Take down and sign the original permit on the "FINAL CHECKUP" line with date and time
- **Scan and email to EHS (ehs@up.edu)**

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HOT WORK SAFETY PROGRAM

1.0 INTRODUCTION

Cutting and welding operations (commonly referred to as hot work) are associated with machine shops, maintenance, and construction activities. Potential health, safety, and property hazards result from the fumes, gases, sparks, hot metal and radiant energy produced during hot work. Hot work equipment, which may produce high voltages or utilize compressed gases, also requires special awareness and training on the part of the worker to be used safely. The hazards associated with hot work at University of Portland can be reduced through the implementation of effective control programs.

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2.0 PURPOSE AND SCOPE

This program establishes the minimum requirements for Hot Work in order to protect University of Portland employees. University of Portland *prohibits* cutting and welding operations unless appropriate steps are taken to minimize fire hazards, such as removal or guarding of combustible materials and, when possible, restricting hot work to specially designated areas. Departments where hot work is performed are responsible for ensuring that adequate controls and procedures are in place before work begins.

3.0 RESPONSIBILITY

All employees of University of Portland are required to comply with the restrictions and limitations of this program. Only *Authorized Employees* are required to perform Hot Work in strict accordance with this program. All contractors (including non-University personnel) must follow the guidelines set forth in this policy.

All University of Portland employees conducting Hot Work must be authorized and trained to do so and must comply with all necessary precautions and work practices.

4.0 APPLICATION

Hot work coverage includes:

- Welding
- Brazing
- Soldering
- Heat treating
- Grinding
- Power-actuated tools
- Hot riveting
- Similar applications producing a spark, flame, or heat.

Hot work coverage does not include the use of:

- Candles
- Laboratory activities
- Pyrotechnics or special effects
- Cooking
- Soldering irons
- Torch-applied roofing (see NFPA 241)



5.0 GENERAL CUTTING AND WELDING CONTROLS

Areas where hot work is done should be properly designated and prepared. Combustible and flammable materials within the work area should be protected against fire hazards and the operation should not pose a hazard to others in nearby areas. To help achieve this, the following controls should be used:

- Cutting and welding operations restricted to authorized, properly trained individuals
- If possible, hot work performed in a properly designed shop area equipped with all necessary controls and adequate ventilation
- Move combustible materials at least 35 feet from the work site. If this is not possible, protect combustible materials with metal guards or by flameproof curtains or covers (other than ordinary tarpaulins)

- Cover floor and wall openings within 35 feet of the work site to prevent hot sparks from entering walls or falling beneath floors or to a lower level
- Fire resistant curtains and /or tinted shields used to prevent fire, employee burns, and ultra-violet light exposure.

Personal Protective Equipment

Personal protective equipment specifically designed for hot work should be provided to and used by workers. The potential for toxic fume emissions from the material being worked on or surface coatings should be considered and appropriate steps should be taken to provide for respiratory protection.



Cutting and Welding in Confined Spaces

When cutting or welding is to be done in confined spaces, appropriate entry procedures should be followed.

Compressed Gas Cylinder Storage and Handling

Storage and handling of compressed gas cylinders are important parts of many cutting and welding operations. The following should be observed:

Oxygen and fuel gas cylinders should be stored separately with the protective valve caps in place. Except when in use, oxygen and fuel gas cylinders should be stored at least 20 feet apart or separated by a noncombustible wall at least 5 feet high;

- Cylinder carts equipped with a cylinder restraint, such as a chain or strap, should be used for all transporting of compressed gas cylinders;
- Cylinders should be secured from tipping, in an upright position;
- Regulators must be compatible with the cylinder and its contents. Many regulators are similar in design and construction. Check the regulator's model number and compare that with the cylinder's requirements.



Ventilation and Atmospheric Testing

Hot work should not be conducted in the presence of explosive mixtures of flammable gases, vapors, liquids, or dusts or where explosive mixtures could develop inside improperly prepared tanks or equipment. If there are concerns of flammable gases, vapors, liquids, or dusts, contact Environmental Health and Safety. Atmospheric testing and monitoring for combustible gases and vapors should be done before work begins and at regular, predetermined intervals thereafter. Ventilation of the work site, either through local or general exhaust ventilation, should be adequate for the work performed.

6.0 FIRE WATCH PROCESS

The purpose of a fire watch is to serve as temporary ‘human smoke detectors’ and to notify building occupants at the first sign of smoke or fire. The person assigned to a fire watch should be equipped with a two-way radio to notify Campus Safety if a fire and/or smoke has been detected. A fire watch is conducted when a building’s fire system is down, or during risky activities such as hot work (welding and cutting). The requirement of a fire watch shall be determined by the kind of hot work being performed and the circumstances under which the hot work is executed. A fire watch, when warranted, shall be provided during and for the entire 30-minutes after the hot work operation and then again when a four-hour period has passed since the hot work was executed. The Hot Work Supervisor will determine if a fire watch is necessary and notify the Hot Work Operator as well as Campus Safety and Environmental Health and Safety. When a fire watch is not required, the Hot Work Supervisor or Hot Work Operator must make a final inspection of the area 30 minutes after the completion of the hot work operations to detect for and potential fires or smoldering embers.

A fire watch can be performed by any combination of Campus Safety, Physical Plant, Environmental Health and Safety, or outside contractor personnel who are trained in the use of fire extinguishers and in sounding a fire alarm. During business hours (8am-5pm) Physical Plant staff will complete the fire watch responsibilities. If the four-hour period falls after business hours Campus Safety should be alerted, and a Campus Safety Officer will perform the fire watch.

In conjunction with the Hot Work Supervisor, the Hot Work Operator shall establish proper fire-watch procedures when hot work is performed in a location where other than a minor fire might develop where the following conditions exist:

- combustible materials in the building construction or contents are closer than 35 feet to the point of hot work.
- Combustible materials in a building are more than 35 feet away but are determined to ignite easily by sparks.
- Wall or floor openings are within 35 feet and expose combustible materials in adjacent areas, including combustible materials concealed in walls or floors
- Combustible materials are adjacent to the opposite side of partitions, walls, ceilings, or roofs and are likely to be ignited

A fire watch may be required in multiple spaces if combustible materials that could be ignited by hot work operations cannot be directly observed by a single fire watch (such as combustible items that could be impacted in separate rooms).

A person ***other than the operator*** should perform fire watch duties and remain at the work site for at least 30 minutes after hot work operations have ended. Additionally, the following steps should be taken:

- A fire extinguisher rated at not less than 2-A:20-B:C must be available in shop areas where hot work is performed;

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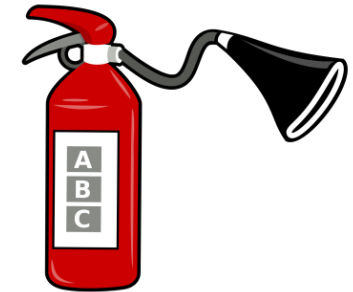
- A fire extinguisher rated at not less than 2-A:10-B:C must be attached to all portable cutting and welding carts;
- If a building or area is equipped with a sprinkler system, then that system must be operational when hot work is performed

To Perform a Fire Watch:

- Conduct a continuous patrol of all designated areas at least once every 30 minutes
- Look for observable signs of smoke, fire, and hazardous conditions
- Enter all stairwells- open doors and look into each stairwell
- Enter all common areas including basements, lounges, laundry rooms, and dining areas

At the first sign of smoke or fire, the fire watch personnel must:

- Pull the nearest fire alarm pull station
- Notify building occupants to evacuate in the event there is no fire alarm pull station
- Small fires may be extinguished using a fire extinguisher
- Exit the building and notify Campus Safety by phone or radio



Fire Extinguisher Training is available to all University of Portland employees via the online training learning platform Moodle. To be enrolled in the training contact Environmental Health and Safety at ehs@up.edu.

7.0 HOT WORK PERMITS

Hot work permits must be used where cutting or welding is performed; authorized personnel (Campus Safety/EHS/Physical Plant supervisor) must sign-off on the permit before Hot Work may begin. Hot work permits help minimize the risk of fire during cutting and welding activities by serving as a checklist for operators and those performing fire watch duties.

The person responsible for issuing permits should be qualified to examine the work site and ensure that appropriate protective steps, such as those listed in this section, have been taken. A hot work permit should be issued at the beginning of each shift for each specific operation.

Hot work operations in confined spaces requires additional safeguards and are addressed in the University of Portland Confined Space Policy and Permit Program. Hot work on or near building systems and piping may require additional safeguards with respect to hazardous energy and are addressed in the University of Portland Lock Out-Tag Out Procedures. All hot work performed by outside contractors shall be conform to this written plan and with the National Fire Protection Association Standard 51B (Standard for Fire Prevention During Welding, Cutting, and Other Hot Work).

8.0 RESPONSIBILITIES DURING HOT WORK

Hot Work Supervisor:

The Hot Work Supervisor is responsible for the overall safe operation of hot work activity under his or her supervision. These responsibilities include:

- Establishment of a permissible area for hot work
- Ensure only approved equipment are used (approved torches, manifolds, regulators, pressure valves, etc.)
- Ensure that all individuals involved in hot work operations are familiar with this policy and its requirements
- Ensure that all individuals involved in hot work are trained in safe operations of their equipment and possible emergency procedures
- Determination of site-specific flammable materials, hazardous processes, or other potential fire hazards present, or likely to be present, in the work location.
- Determine if a fire watch is necessary and ensure the hot work area is monitored via the fire watch for four hours after the work is completed, if necessary
- Notify Campus Safety and Environmental Health and Safety of the hot work operation.

The hot work supervisor may be the shop supervisor, the Assistant Director of Physical Plant, the Director of Physical Plant, or the Office Manager of Physical Plant.

Hot Work Operator:

The Hot Work Operator is responsible for operating equipment safely and performing work safely and in accordance with this policy to ensure safe operation of hot work activity under his/her control. The Hot Work Operator must have written authorization from the Hot Work Supervisor to perform hot work. The Hot Work Operator must immediately cease hot work operation if unsafe conditions develop or if requested to do so by the Hot Work Supervisor, Environmental Health and Safety, or Campus Safety. If unsafe conditions develop the Hot Work Supervisor and Campus Safety should be notified immediately.

Responsibilities include:

- Ensuring combustibles are protected from ignition by moving the work to a location free of combustibles or if work cannot be moved to a location free of combustibles ensure that combustibles are moved to a safe distance or properly shielded against ignition.
- Ensure that hot work is scheduled such that operations that could expose flammables or combustibles to ignition do not occur during hot work operations
- Ensure that fire protection and extinguishing equipment are properly located and readily available while performing hot work

Fire Watch Personnel:

A fire watch can be performed by any combination of Campus Safety, Physical Plant, Environmental Health and Safety, or outside contractor personnel who are trained in the use of fire extinguishers and in sounding a fire alarm. The Hot Work Supervisor will determine if a fire watch is necessary and notify the Hot Work Operator as well as Campus Safety and Environmental Health and Safety. If a fire watch is required, the fire watch personnel will monitor the area for continuously for 30 minutes after hot work operation, and then repeatedly for four hours.

9.0 TRAINING

All persons performing hot work should be trained in proper equipment operation, handling and storage of welding materials, compressed gas safety, chemical hazards, and in working procedures, including the written hot work permit. Additional training may also be necessary in the proper selection and use of personal protective equipment. Training in confined space entry is necessary before performing hot work in confined space areas.

All staff involved in the fire watch process must complete the online Fire Extinguisher Safety training course.

Appendix A



Hot Work Safety Guidelines

General Guide to the Completing the University of Portland Hot Work Checklist

- 1.** Welding and cutting operations should be restricted to workers who have been properly trained.
- 2.** Hot Work Permits are required for all welding and cutting operations. Permits are obtained from the main Physical Plant office and must be taken to Campus Safety for sign off before beginning the hot work, and emailed to EHS after completion.
- 3.** Whenever possible, hot work should be performed in a properly designed shop area equipped with all necessary controls and adequate ventilation.
- 4.** Combustible materials, such as building construction materials or other building contents, must be located at least 35 feet from the hot work area or properly protected to prevent hot sparks from contacting them. Floors within this area must also be swept clean of all combustible materials.
- 5.** All openings in floors and wall within 35 feet of the hot work area must be covered to prevent hot sparks from entering walls or falling beneath floors or to a lower level.
- 6.** Hot work should not be conducted in the presence of explosive mixtures of flammable gases, vapors, liquids, or dusts or where explosive mixtures could develop inside improperly prepared tanks or equipment. If there is concern of the presence of flammable gases, vapors, liquids, or dusts EHS should be notified and atmospheric testing and monitoring for combustible gases and vapors should be conducted before work begins and at predetermined intervals thereafter.
- 7.** Fire resistant curtains and tinted shields should be used to prevent fire, employee burns, and ultra-violet light exposure.
- 8.** Personal protective equipment specifically designed for hot work should be provided to and used by workers. The potential for material being worked on or surface coatings to emit toxic fumes should be considered.
- 9.** A fire extinguisher rated at not less than 2-A:20-B:C must be available in shop areas where hot work is performed. A fire extinguisher rated at not less than 2-A:10-B:C must be attached to all portable welding carts.
- 10.** The building's sprinkler system, if so equipped, must be operational before hot work can begin.
- 11.** A person other than the operator should perform fire watch duties and should remain at the worksite for at least 30 minutes after hot work operations have ended. This could be a Campus Safety Officer, Hot Work Supervisor, or Environmental Health and Safety.

Appendix B. Welding and Cutting (Hot Work) Operations Checklist

Building/Area _____ Room _____ Supervisor _____ Date _____

Checklist Completed by _____

	Y	N	NA	COMMENTS
A. General Welding and Cutting Controls				
1. Welding and cutting operations restricted to authorized employees				
2. Hot Work Fire Code Permit obtained				
3. Hot work performed in a shop area, if possible				
4. Combustible materials moved at least 35 feet from worksite				
5. Floor and wall openings covered at least 35 feet from worksite				
6. Procedures developed to prevent welding and cutting in the presence of explosive or toxic air contaminants				
7. Fire resistant curtains and/or tinted shields provided				
8. Local or general exhaust ventilation adequately used				
9. Appropriate personal protective equipment provided and used				
10. Appropriate fire extinguishers provided in vicinity of hot work				
11. Building sprinkler systems operational, when applicable				
12. Procedures developed to establish and maintain a fire watch in hot work areas				
13. Hot work permit used				

Continued....

	Y	N	NA	COMMENTS
B. Welding or Cutting in Confined Spaces				
1. Procedures developed for confined space entry and rescue				
2. Ventilation and/or respiratory protection provided				
3. Welding and cutting equipment left outside space				
4. Electrodes removed from holders and/or gas supply shut off when operations are suspended for any substantial period				
5. Hot work permit used				
C. Compressed Gas Cylinders				
1. Oxygen and fuel gas cylinders stored separately with protective valve caps in place				
2. Regulators compatible with gas cylinder				
3. Cylinder carts used for transport				
4. Cylinders secured from tipping while in use				
5. Empty or unused gas cylinders promptly returned to supplier				
D. Training				
1. Workers trained in use of welding and cutting equipment, material hazards, and control methods				
2. Personal protective equipment training provided				
3. Confined space entry training provided, where necessary				

HOT WORK SAFETY

Appendix C. Hot Work Permit Checklist

Make sure to complete steps 8A & 8B, the final inspection and scanning the copy to EHS as these are critical parts of safety and our own documentation.

1. Complete Hot Work Permit.

- Hard Copies: Located in Physical Plant Main Office, below mailboxes in upper right drawer.
- Electronic copy:
- P.Plant U: drive > EHS > Hot Work Permits
- *Note: the Permit. No. is 6-digits – the calendar year, -, number found on spreadsheet in U:drive > EHS > Hot Work Permits > [YEAR] ex: "2021-01"

2. Receive signature approval.

- The following roles can sign/approve the permit request: Your Supervisor, Assistant Director, Director, or Office Manager.

3. Deliver or email a copy of the permit to Campus Safety prior to work.

- Communicate any other details they may need to be aware of. Ensure they are aware and do not just drop off the permit. campussafety@up.edu

4. Post original permit copy at your job site.

5. Complete hot work project.

6. Inspect work area.

- Immediately post work to ensure safe and secure.

7. Sign the Original Permit copy posted at the job site.

- Sign with Date and time of completion on the "FIRE WATCH SIGNOFF" line.
- Leave the Original copy with the signature posted.

8. Return to Campus Safety.

- Communicate the work is complete and the actual time the work was completed.
- If the 4-hour final inspection time falls afterhours, ensure Campus Safety is aware so they know what time the 4-hour final inspection is needed.
- Sign their permit copy with date and time, on the "FIRE WATCH SIGNOFF" line.

9. Complete 4-hour final inspection (if during business hours)

- Go to the work site and complete final inspection and ensure the area is safe and that nothing has begun to smolder, developed into a flame, etc.
- Take down and sign the original permit on the "FINAL CHECKUP" line with date and time
- **Scan and email to EHS (ehs@up.edu)**