



UBC Facilities Hot Work Safe Work Procedure

Prepared By: Trades Joint Occupational Health & Safety Committee Safety & Risk Services	Approved By: Trades Joint Occupational Health & Safety Committee	Document No: I-B-55	Issue Date: January 2024
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Introduction

UBC is dedicated to maintaining a safe and healthy work environment for all campus members by providing guidance to protect personnel and property injury, illness and damage from fire and explosions that may occur from hot work activities. This procedure defines the responsibilities and requirements for performing hot work and established controls through the use of a Hot Work Fire Safety Plan (Appendix A).

This Hot Work safe work procedure establishes the means to assess the work area and the planned hot work activity to ensure sufficient and necessary controls are in place to prevent a fire. Hot work will only be performed in areas that are or have been made fire safe. Where fire prevention precautions, such as a fire suppression system or a fire or smoke detection system are not sufficient, a fire watch person shall be assigned to monitor the area for fire, as needed.

Scope

This Hot Work safe work procedure applies to UBC Facilities employees.

Hot work refers to any process that can be a source of ignition when flammable materials are present or can be a fire hazard regardless of the presence of flammable material in the workplace. Such operations include, but are not limited to cutting, welding, soldering, brazing, grinding, adhesive bonding, roofing operations, thermal spraying and thawing pipes.

A Hot Work Fire Safety Plan (Appendix A) is required to be completed for all hot work activities.

EXCEPTION: Hot Work Fire Safety Plans are **NOT** required for work conducted in designated welding areas or shops with appropriate ventilation and fire alarm devices. Hot Work Fire Safety Plans are also **NOT** required for normal laboratory operations. These areas are subject to regular documented workplace inspections that include the assessment of fire hazards and control measures.

Fire watch is **NOT** required if the hot work is carried out in an area free of combustible and flammable contents, with walls, ceilings and floors of noncombustible construction or lined with noncombustible materials (**this would be low intensity type work where you can line the area with noncombustible materials**)

References

- British Columbia’s Occupational Health and Safety Regulation [Part 12.112 – 12.126 Welding, Cutting and Allied Processes](#)
- [CSA Standard W117.2-12 Safety in Welding, Cutting and Allied Processes](#)
- [BC Fire Code 2018, Division B, Section 5.2: Hot Works](#)
- [BC Fire Code 2018, Division B, Section 6.2: Portable Extinguishers](#)
- [UBC Facilities I-B-41 Fire Watch Safe Work Procedure](#)
- [University Health and Safety Policy - SC1](#)



Legal Requirement

Occupational Health and Safety Regulation (OHSR) requires employers to ensure the health and safety of their workers and to ensure controls are in place to prevent incidents and accidents from occurring. OHSR outlines the requirements in accordance with the requirements of CSA Standard W117.2-94 Safety in Welding, Cutting, and Allied Processes. BC Fire Code outlines additional requirements as it pertains to hot work and portable extinguishers.

Definitions

Hot Work: Any process that can be a source of ignition when flammable materials are present or can be a fire hazard regardless of the presence of flammable material in the workplace. Such operations include, but are not limited to cutting, welding, soldering, brazing, grinding, adhesive bonding, roofing operations, thermal spraying and thawing pipes.

Hot Worker: Person performing the hot work activity.

Hot Work Fire Safety Plan – The document used to identify hot work activity and identify hazards and necessary safety precautions. The Hot Work Fire Safety Plan is posted at the worksite during the work activity and remains posted until the fire watch is completed. The Hot Worker must be able to show the document on demand. See Appendix A.

Fire Watch – A person trained to monitor the work area during and after the hot work to identify fire hazards, prevent unintended ignition, and respond appropriately. A person trained in the use of fire suppression equipment and alarm activation is qualified to perform the fire watch. Fire suppression equipment and a means of communication must be immediately available during a fire watch. This person may not be assigned to any other task and will not be doing the actual hot work.

Responsible Supervisor – A person representing UBC who has engaged the hot worker to perform hot work. This person could be a UBC supervisor, Project Manager, team leader, staff, faculty or contractor.

Roles & Responsibilities

Employer

- Ensure personal protective equipment, supplies, and resources required for hot work activities are made available.
- Ensure written Hot Work safe work procedures are developed.
- Provide appropriate training resources as it pertains to Hot Work
- Ensure compliance with British Columbia's Occupational Health and Safety Regulation, BC Fire Code and other applicable standards.

Responsible Supervisor

- Review hot work activity with Hot Worker and complete a Hot Work Fire Safety Plan with the Hot Worker.
- Assign a fire watch to the hot work activity, if required.
- Ensure hot worker and fire watch understand their responsibilities.
- Contact Fire Life & Safety if hot work activity may negatively impact the fire protection system. Fire Life & Safety to review and bypass the identified fire protection devices accordingly. Responsible Supervisor to inform Fire Life & Safety once hot work activity and fire watch is complete so that the fire protection system can be restored to normal operations. If a fire protection system is shutdown or inoperable, I-B-41 Fire Watch Safe Work Procedure is to be followed.
- Inspect hot work areas to ensure the Hot Work Fire Safety Plans are posted and that all requirements are met
- Keep record of completed Hot Work Fire Safety Plans.



Hot Worker (Employees)

- Review hot work activity with responsible supervisor and complete a Hot Work Fire Safety Plan with responsible supervisor.
- Post the approved Hot Work Fire Safety Plan at the location of the hot work.
- Use required PPE and inspect to ensure it is in good working condition. Tight-fitting respirators must be fit tested prior to first use and annually thereafter
- Ensure all required equipment and supplies needed for hot work activity is available and in proper working condition
- Conduct hot work activity in accordance with UBC requirements, Hot Work safe work procedure and Hot Work Fire Safety Plan.
- Remove the Hot Work Fire Safety Plan and forward to responsible supervisor upon completion of hot work activity.
- Report any incident/accident immediately to supervisor.

Fire Watch

- Review Hot Work Fire Safety Plan and understand the hazards present.
- Understand how to identify fire hazards, prevent unintended ignition and respond with the use of fire suppression equipment and alarm activation.
- Monitor the area where hot work is occurring during and after the hot work has been completed (including lunch/coffee breaks)
 - Continuous fire watch during hot work, 1-hour continuous fire watch after work is completed and a final visual inspection 4 hours after completion of work, OR
 - Continuous fire watch during hot work, 1-hour continuous fire watch after work is completed and a comprehensive visual inspection 2 hours after completion of work and uses equipment (e.g. thermal scanners or infrared thermometers) to take temperature readings every 15 minutes after work is completed.
 - Documenting the temperature readings within the Hot Work Fire Safety Plan.
 - At the end of the 2-hour period, if the temperature is 25C or less, the area is considered to be low-risk.
 - **WARNING: If there's any risk of fire, the fire watch must extend the testing period.**
- If a fire protection system is shutdown or inoperable, I-B-41 Fire Watch Safe Work Procedure is to be followed.
- Notify the responsible supervisor when fire watch is complete.

Fire Life & Safety

- Review hot work activity with responsible supervisor or hot worker. Should hot work activity negatively impact the fire protection system, identify and temporarily bypass the fire protection devices.
- If a fire protection system is shutdown or inoperable, I-B-41 Fire Watch Safe Work Procedure is to be followed.
- Return fire protection system back to normal status only when Responsible Supervisor confirms that hot work activity and fire watch is complete.

Safety & Risk Services

- Periodically review the Hot Work safe work procedure in conjunction with the Joint Occupational Health and Safety Committees for continuous improvement.

Hazards

Hot work activities can present different types of hazards to workers and their surrounding environment. The most common and significant risk of hot work is fire and explosions.

Fire hazards posed by hot work include:



- Flying sparks – sparks can easily get trapped in cracks, pipes, gaps, holes and other small openings, where it will potentially smoulder and start a fire
- Flammable filings, molten metals and hot slag – debris and residue that hot work creates are often highly combustible and/or hot
- Hot surfaces – if flammable materials or substances are not properly removed before starting hot work, they could come into contact with a surface and become hot during the work and can start a fire
- Explosive atmospheres – in certain environments there may be vapours or gases in the air that are highly combustible and could ignite when exposed to hot work. Similarly, hot work could generate fumes that create an explosive atmosphere.

Additional hazards include, but are not limited to:

- Exposure to fumes and gases – hot work can expose workers to hazardous fumes and gases that result in severe health and safety impacts
- Heat exposure – hot work can expose workers to dangerous elevated temperatures and heat build up in the body, which can result in heat stress, heat stroke and unconsciousness.

The above hazards will need to be reviewed for each hot work activity and appropriate and effective controls will need to be in place to eliminate and/or minimize safety and health risks.

Fire Triangle

To understand how to prevent fires, it is important to know how a fire can occur. There are 3 elements that must be present at the same time for a fire to take place, hence the name fire triangle:

- Fuel or combustible material to burn
- Oxygen that sustains combustion (the fire)
- Ignition source (e.g. heat, spark, etc.)

If any one of the 3 elements is missing the fire will not take place and/or stop.

Controls

When hazards have been identified, determine if alternative methods to hot work could be used (e.g. relocating hot work to a welding shop, mechanical fastening instead of welding). Move all flammable and combustible materials away from the work area. If combustibles cannot be moved, cover them with fire resistant blankets or shields. Additional controls are listed in the Safety Checklist within the Hot Work Fire Safety Plan (Appendix A).

Training Requirements

Employees performing hot work activities and fire watch must be trained in the Hot Work Safe Work Procedure and in the use of any equipment and substances.

Fire watch must also be trained on how to identify fire hazards, prevent unintended ignition and respond with the use of fire suppression equipment and alarm activation.

Materials/Equipment

All PPE, equipment and supplies required for hot work activities must be in good operating condition. PPE and equipment that are required to be inspected or certified on a specified/recommended frequency must be inspected or certified prior to their use.











Hot work equipment shall be examined for leakage or defects prior to each use and repaired prior to use.

All valves shall be closed and gas lines bled when hot work equipment using dangerous goods classified as compressed gases is not in use. Electric hot work equipment shall be de-energized when not in use.

At least one fire extinguisher of a suitable type and capacity must be immediately available at a work location where hot work is done. Fire extinguisher locations must be identified on the Hot Work Fire Safety Plan and made known to workers.

Types of Fires and Extinguishers

There are various classes of fires and the correct fire extinguisher must be used to extinguish a fire.

Types of Fires	Fire Safety Equipment to be Used	Symbol and Picture
Ordinary Combustibles (e.g. wood, paper)	Class A Fire Extinguisher	 
Flammable Liquids (e.g. gasoline, solvents, oils)	Class B Fire Extinguisher	 
Electrical (e.g. wiring circuit boards, computers)	Class C Fire Extinguisher	 
Combustible Metals (e.g. potassium, sodium, magnesium)	Class D Fire Extinguisher	 
Cooking Media (e.g. fats, grease, oils)	Class K Fire Extinguisher	 

The ABC fire extinguisher is the most common on campus and they can extinguish Class A, B and C fires.

How to use a Fire Extinguisher

Before operating a fire extinguisher, make sure you have a clear evacuation route.

When using a fire extinguisher, use the acronym PASS – Pull, Aim, Squeeze, Sweep

- **Pull** the pin at the top to break the tamper seal on the extinguisher
- **Aim** at the base of the fire and stand 8-10 feet away
- **Squeeze** the lever to release the extinguishing agent
- **Sweep** the extinguisher from side to side, continuing to aim at the base of the fire until the flames are totally extinguished.



Determination of Fire Watch

A fire watch is required for the Hot Work Fire Safety Plan if **ANY** of the following conditions exist:

- Fire Life Safety have indicated a fire watch is required (e.g. when fire protection systems are shut down or inoperable, I-B-41 Fire Watch Safe Work Procedure is to be followed).
- Any flammable or combustible materials are located within 15 metres (BC Fire Code requires these materials be protected against ignition).
- The Hot work is being done in an area where flammable and combustible materials are located more than 15 metres away, but could easily be ignited by sparks.
- There is a possibility of sparks leaking onto combustible materials in area adjacent to the area where the hot work is carried out. Opening in walls, floors or ceilings shall be covered or closed to prevent the passage of sparks to such adjacent areas.
- Conditions change during the course of the hot work that increases the risk of fire.
- Required by BC Fire Code.
- Will monitor the area where hot work is occurring during and after the hot work has been completed (including lunch/coffee breaks)
 - Continuous fire watch during hot work, 1-hour continuous fire watch after work is completed and a final visual inspection 4 hours after completion of work, OR
 - Continuous fire watch during hot work, 1-hour continuous fire watch after work is completed and a comprehensive visual inspection 2 hours after completion of work and uses equipment (e.g. thermal scanners or infrared thermometers) to take temperature readings every 15 minutes after work is completed.
 - Documenting the temperature readings within the Hot Work Safety Plan.
 - At the end of the 2-hour period, if the temperature is 25C or less, the area is considered to be low-risk.

Safe Work Procedure

Pre-Procedure Set-Up:

1. Responsible Supervisor reviews hot work activity with Hot Worker and complete a Hot Work Fire Safety Plan with the Hot Worker.
2. Responsible Supervisor to assign a fire watch to the hot work activity, if required.
3. Responsible Supervisor to contact Fire Life & Safety if hot work activity may negatively impact the fire protection system. Fire Life & Safety to review and bypass fire protection devices if required.
4. Responsible Supervisor reviews completed Hot Work Fire Safety Plan with all affected workers (e.g. Hot Worker, Fire Watch) to ensure they understand their roles, responsibilities and legislative requirements.
5. Hot Worker to obtain all PPE, equipment and supplies required for hot work.
6. Hot Worker to post completed Hot Work Fire Safety Plan at the location of the hot work.

Procedure:

1. Hot Worker to conduct hot work activity in accordance with UBC requirements, Hot Work safe work procedure and Hot Work Fire Safety Plan.
2. Hot Worker must mark "HOT" on or effectively guard recently welded or flame cut work to prevent contact by a worker, if a worker not directly involved in the hot work is likely to enter the work area.
3. Responsible Supervisor to inspect hot work areas to ensure the Hot Work Fire Safety Plans are posted and that all requirements are met.



4. Fire Watch, if required, will monitor the area where hot work is occurring during and after the hot work has been completed (including lunch/coffee breaks)
5. Fire Watch, if required, will monitor the area where hot work is occurring during and after the hot work has been completed (including lunch/coffee breaks)
6. Continuous fire watch during hot work, 1-hour continuous fire watch after work is completed and a final visual inspection 4 hours after completion of work, OR
7. Continuous fire watch during hot work, 1-hour continuous fire watch after work is completed and a comprehensive visual inspection 2 hours after completion of work and uses equipment (e.g. thermal scanners or infrared thermometers) to take temperature readings every 15 minutes after work is completed.
8. Documenting the temperature readings within the Hot Work Safety Plan.
9. At the end of the 2-hour period, if the temperature is 25C or less, the area is considered to be low-risk.
10. Fire Watch will notify the responsible supervisor when fire watch is complete.
11. **WARNING: If there's any risk of fire, the designated Fire Watch must extend the testing period as required.**

Post Procedure:

1. Responsible Supervisor to inform Fire Life & Safety once hot work activity and fire watch is complete so that the fire protection system can be restored to normal operations, if applicable.
2. Hot Worker to remove Hot Work Fire Safety Plan and forward to responsible supervisor upon completion of hot work activity.
3. Responsible Supervisor to keep record of completed Hot Work Fire Safety Plan.

Emergency Response

In the event of an incident/accident that results in an injury contact UBC Occupational First Aid at 604.822.4444.

In the event of a fire and fire watch is not able to contain the fire with the use of a fire extinguisher, call 911 for Vancouver Fire & Rescue Services.

All fires must be reported in the UBC Centralized Accident Incident Reporting System (CAIRS).

Appendix A:

Hot Work Fire Safety Plan



Appendix A: Hot Work Fire Safety Plan

A COPY OF THIS HOT WORK FIRE SAFETY PLAN MUST BE POSTED AT THE WORKSITE DURING HOT WORK

This Hot Work Fire Safety Plan must be completed and posted at the worksite when work activities can be a source of ignition when flammable materials are present or can be a fire hazard regardless of the presence of flammable material in the workplace. This includes, but is not limited to cutting, welding, soldering, brazing, grinding, adhesive bonding, roofing operations, thermal spraying and thawing pipes.

EXCEPTION: Hot Work Fire Safety Plans are **NOT** required for work conducted in designated welding areas or shops with appropriate ventilation and fire alarm devices. These areas are subject to regular documented workplace inspections that include the assessment of fire hazards and control measures.

Fire watch is **NOT** required if the hot work is carried out in an area free of combustibles and flammable contents, with walls, ceilings and floors of noncombustible construction or lined with noncombustible materials (**this would be low intensity type work where you can line the area with noncombustible materials**)

Refer to the Hot Work Safe Work Procedure for roles, responsibilities and legislative requirements.

LOCATION & HOT WORK DETAILS						
DEPARTMENT:				WORK ORDER #:		
LOCATION OF HOT WORK:	Building:			Room:		
	Floor:			Other:		
HOT WORK START DATE/TIME	Date:	Time (AM/PM):	HOT WORK END DATE/TIME	Date:	Time (AM/PM):	
DESCRIPTION OF HOT WORK TO BE DONE (Describe and identify ALL applicable work activities)						
	<input type="checkbox"/> Cutting <input type="checkbox"/> Welding <input type="checkbox"/> Soldering <input type="checkbox"/> Brazing <input type="checkbox"/> Grinding			<input type="checkbox"/> Adhesive bonding <input type="checkbox"/> Roofing operations <input type="checkbox"/> Thermal spraying <input type="checkbox"/> Thawing pipes <input type="checkbox"/> Other: _____		

MINOR FIRE PROTECTION IMPAIRMENT DETAILS	
Which fire protection system will be impaired? <input type="checkbox"/> Fire Alarm System <input type="checkbox"/> Sprinkler System <input type="checkbox"/> N/A	
Fire protection devices to be disabled:	Device addresses:
IN THE EVENT OF AN EMERGENCY, THE FIRE ALARM WILL BE INITIATED BY:	
<input type="checkbox"/> Activating the nearest manual pull station <input type="checkbox"/> Other: _____	



SAFETY CHECKLIST (Complete prior to start of Hot Work)			
General Requirements	YES	NO	N/A
Available sprinklers, hose streams and fire extinguishers are in service and operable. At least one portable fire extinguisher shall be provided in the hot work area. Location of fire extinguisher: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hot work equipment in good working order	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Requirements within 15 metres of work	YES	NO	N/A
Flammable liquids, dust, lint, and oily deposits removed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Explosive atmosphere in area eliminated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Floors swept clean	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Combustibles removed from work area, or properly shielded and protected with fire resistant materials (e.g. damp sand, metal shields, fire resistant pads)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All wall and floor openings covered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire-resistive pads are suspended beneath work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All wall and floor openings are covered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work on Walls and Ceilings	YES	NO	N/A
Construction is non-combustible and without combustible covering or insulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Combustibles on other side of walls/ceilings/roofs are removed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work on Enclosed Equipment	YES	NO	N/A
Enclosed equipment is cleaned and free from all combustibles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Containers purged of flammable liquids/vapours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pressured vessels, piping and equipment removed from service, isolated, and vented	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire Watch/Hot Work Monitoring (If Applicable)	YES	NO	N/A
Fire watch to be provided during (including lunch/coffee breaks) and for 60 minutes after completion of work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Final inspection of hot work area will be conducted 2 hours after completion of work with temperature readings recorded in the hot work log	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire watch is supplied with suitable portable fire extinguishers specific for fire watch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire watch is trained in the use of fire suppression equipment, initiating the alarm system, and calling 911	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other precautions taken:			

SIGN-OFF			
Workers signing this form acknowledge they have reviewed this Hot Work Fire Safety Plan and understand the work to be done, their roles and responsibilities, hazards involved and confirms precautions have been taken.			
_____	_____	_____	_____
Hot Worker Name	Phone Number	Signature	Date (MM/DD/YY)
_____	_____	_____	_____
Fire Watch Name (If Applicable)	Phone Number	Signature	Date (MM/DD/YY)
_____	_____	_____	_____
Responsible Supervisor Name	Phone Number	Signature	Date (MM/DD/YY)

IN CASE OF AN EMERGENCY CALL 911

