

*SUNY Cortland - Environmental Health and Safety Office
Service Group, Room 108
P.O. Box 2000
Cortland, NY 13045
607-753-2508*



**SUNY CORTLAND
ENVIRONMENTAL HEALTH
AND SAFETY OFFICE**

HOT WORK PROGRAM - NFPA 51B

PROGRAMS, POLICIES, AND PROCEDURES

Inception Date: February 20, 2014
Latest Revision / Review: February 10, 2020
Previous Revision / Review: August 7, 2018

Hot Work Program

NFPA 51B

*REVISION 1
JULY 2022*

Revision History

Revision	Date	Reason for Revision
0	January 2022	Initial Issue
1	July 2022	Updated Format

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Hot Work Program

1. Purpose

SUNY Cortland recognizes that there is a potential for injury to people and damage to property that can result from fire or sparks that arise when hot work is performed outside of a designated safe hot work area. The following Hot Work Program provides written procedures to help prevent the outbreak of fire, fire alarm activations, and smoke/odor migration in buildings resulting from work involving open flames, producing heat, or sparks. This includes, but is not limited to brazing, cutting, grinding, torch soldering, thawing pipes, torch applied roofing, and welding.

This operating procedure establishes a permit authorization system to ensure that all hazards are evaluated and that appropriate safety measures and controls are taken prior to and during any operation that uses an open-flame or spark-producing apparatus.

This operating procedure is written in accordance with the following:

- Occupational Safety & Health Administration's (OSHA) workplace standard, 29 CFR 1910.252 - Welding, Cutting and Brazing
- National Fire Protection Association (NFPA) Standard 51B, Fire Prevention During Welding, Cutting, and Other Hot Work
- International Fire Code (IFC) Chapter 35, Welding and Other Hot Work
- Fire Code of New York (2010) Chapter 26

SUNY Cortland's programs, policies and procedures applicable to this program are as follows:

- SUNY Cortland's Emergency Action Plan
- SUNY Cortland's Fire Watch Program
- SUNY Cortland's Personal Protective Equipment Program
- SUNY Cortland's Welding, Cutting, and Brazing Program

2. Applicability

Hot work operating procedures shall apply to all SUNY Cortland faculty, staff, students, volunteers, visitors, and all contract personnel conducting hot work at, in, and around all University-owned, leased, and/or occupied properties. This policy applies to projects and major occupied renovations, it does not apply to new construction or unoccupied renovations. Therefore, general contractors must show proof of compliance within their own system for the management of hot work, and are subject to audit of the program/worksites by SUNY Cortland's Office of Environmental Health and Safety. The completed Hot Work Permits on construction sites are not required to be submitted to SUNY Cortland EH&S.

3. Definitions

Brazing and Soldering: Soldering and brazing use molten metal to join two pieces of metal. The metal added during both processes has a melting point lower than that of the workpiece, so only the added metal is melted, not the workpiece. Brazing produces a stronger joint than does soldering, and often is used to join metals other than steel, such as brass. Brazing can also be used to apply coatings to parts to reduce wear and protect against corrosion.

Cutting / Grinding: An abrasive process that uses a rotating abrasive wheel as a cutting tool. The process produces sparks capable of igniting combustible or flammable materials.

Designated Hot Work Area: A permanent area that has been designated by the local fire code official to be used for hot work operations including, but not limited to, welding, torching, grinding, cutting, etc. This may include areas such as maintenance shops, art facilities, or laboratories and does not require a daily permit to perform hot work.

Hot Work: Hot work is any work process that involves welding, soldering, brazing, cutting, grinding, drilling, burning, or melting of substances capable of creating a spark or flame of sufficient temperature to ignite flammable vapors and/or combustible material. (NFPA's definition includes flame-producing activities, spark-producing activities, and heat production, either through conduction or radiation/convection.)

Hot Work Permit: A document that will be required when a task requires the use of an open-flame or spark-producing apparatus. Permits are issued by an issuing authority within the University following the permitting procedures set forth by the 2015 International Fire Code.

Welding and Allied Processes: Joining together (metal pieces or parts) by heating the surfaces to the point of melting using Processes such as arc welding, oxy-fuel gas welding, open-flame soldering, brazing, thermal spraying, oxygen cutting, and arc cutting.

4. Hot Work Assignments and Responsibilities

4.1 Environmental Health and Safety (EH&S)

The Environmental Health and Safety office is responsible for maintaining the written Hot Work Program. EH&S issues Hot Work Permits and conducts hot work permit inspections and approvals prior to hot work being done. EH&S accepts completed Hot Work Permits from contractors performing hot work activities in occupied SUNY Cortland buildings. EH&S will provide assistance to contractors upon request.

4.2 Permit Authorizing Individual (PAI)

In conjunction with EH&S, the PAI shall be responsible for the safe operation of hot work activities.

A Permit Authorizing Individual inspects hot work sites prior to the start of hot work operations using the checklist found on the Hot Work Permit Form. When a fire watch is required, the PAI will designate an employee to serve as Fire Watch. Once all requirements on the forms have been satisfied and the form is signed by a PAI, the document becomes a Hot Work Permit and must be posted in the area where hot work is to be performed.

4.3 Hot Work Operator

The hot work operator shall handle equipment safely and use it as follows so as not to endanger lives and property:

- a. The operator shall have the PAI's approval before starting hot work operations
- b. All equipment shall be examined to ensure it is in safe operating condition; if found to be incapable of reliable safe operation, the equipment shall be repaired by qualified personnel prior to its next use or be withdrawn from service.
- c. The operator shall cease hot work operations if unsafe conditions develop and shall notify management, the area supervisor, or the PAI for reassessment of the situation.

4.4 Fire Watch

Persons acting as fire watch must:

- a. Receive annual training on the safe operation of fire extinguishers.
- b. Understand the basic hazards of any combustible construction and materials.
- c. Maintain proper isolation of all hot work operations from combustible or flammable materials.
- d. Mitigate fire exposure hazards adjacent to, above or below the hot work operation.
- e. Keep a fire extinguisher with a minimum rating of 2A:20B-C, or a charged water hose, within 30 feet of the hot work location.
- f. Know how to trigger the fire alarm and call the Cortland County 911 Communications Center.
 - Campus Land Line – 911
 - Cell Phone - 911

When calling to report a fire, include the building name, floor, area or room number, injuries, and any other important information.

- g. Watch for fires in all exposed areas.
- h. Extinguish fires only when it is obviously within the capacity of the available equipment.
- i. Trigger the fire alarm if immediate attempts to control a fire are not successful.

- j. Maintain fire watch for the duration of hot work and for at least 30 minutes after completion of the hot work. Monitoring of hot work area can be extended beyond 30 minutes by EH&S, PAI, or Fire Watch as required.

5. Hot Work Permit Issuance and Requirements

- a. A daily hot work permit (Appendix A) must be obtained prior to the start of a hot work operation in a non-designated hot work location. A hot work permit is valid for a maximum of one day. For additional clarification as to whether a hot work permit is required see Appendix B - Hot Work Permit Decision Tree.
- b. Combustible materials and flammable liquids within the required safe distance of the hot work area must be removed, and oily deposits within this distance must be cleaned and/or removed. See table below for safe distances required for various types of hot work.

Type of Hot Work	Safe Distance
Welding	35 ft (11 m)
Grinding	35 ft (11 m)
Cutting	35 ft (11 m)
Brazing	15 ft (5 m)
Soldering	10 ft (3 m)
Other	35 ft (11 m)

- c. Combustible materials within the required safe distance which cannot be removed must be covered or shielded with flameproof covers, fire resistant guards, or fire resistant curtains. The edges of covers at the floor shall be tight to prevent the entrance of sparks. The materials should also be wetted-down, if appropriate for protection of the hazard.
- d. Cracks in walls, floors, ducts, or other concealed spaces within the required safe distance must be covered to prevent the passage of sparks or slag to adjacent areas.
- e. Combustible materials must be removed from the opposite side of walls, partitions, ceilings, or roofs prior to performing hot work on or near such assemblies.
- f. Special precautions must be taken to prevent unwanted activation of automatic fire detection or suppression systems due to hot work operations. This may include impairment of smoke detectors in the work area and/or physical protection of system components that may be activated.

Examples include:

1. Shielding of a sprinkler head or applying a wet rag over the sprinkler head during the hot work operation and immediately removing it following completion of the work.
2. Applying covers on smoke detectors during the hot work operations and immediately removing it following completion of the work.
3. Temporarily deprogramming smoke detectors that may be impacted, and immediately re-engaging the detectors upon completion of the work.

- g. All fire protection systems shall be brought back on-line immediately following completion of hot work.
- h. A flammable vapor test must be conducted by SUNY Cortland EH&S, or other appropriately trained personnel, for any hot work operation when flammable/combustible liquids, vapors, or gases may be present. If test results exceed 25% of the lower explosive limit (LEL) for liquids and 10% LEL for gases, additional precautions may be required.
- i. Where the hot work area is accessible to persons other than the hot work operator, conspicuous signs shall be posted to warn others before they enter the hot work area. The signs shall display the following warning: (Hot Work in Progress Signage is included on the back of the Hot Work Permit)

WARNING
HOT WORK
IN PROGRESS
DO NOT ENTER

- j. A fire watch must be provided for all hot work operations performed outside of a designated (fixed) area hot work location. Fire Watch Decision Matrix in Appendix C will aid in determining fire watch requirements.
- k. A fire watch must have portable fire extinguishing equipment immediately available for use at the hot work operation (not to exceed 10 feet from the actual hot work site or affected area). Portable equipment must include an ABC dry chemical fire extinguisher which has a minimum rating of 2A:20-BC. Other extinguishers and first aid appliances such as an air pressurized water (APW) extinguisher, water pump can, bucket of water, or a hose line may be warranted and required depending on the hot work operation and location. The extinguisher(s) shall be in addition to the portable extinguishers permanently located throughout the facility.
- l. More than one fire watch shall be required if combustible materials that could be ignited by the hot work operation cannot be directly observed by the initial fire watch.
- m. A fire watch shall be maintained for a period of not less than 30 minutes following completion of hot work.
- n. A more hazardous condition or situation may warrant the fire watch being extended beyond the initial 30 minutes, and is at the discretion of the PAI or EH&S.
- o. The Daily Hot Work Permit shall be posted within the vicinity of hot work. The daily hot work permit shall be returned to the PAI immediately following completion of the hot work operation, and notification made to EH&S that hot work has ceased.
- p. The original daily hot work permit must be returned to the SUNY Cortland EH&S office for final record keeping.

6. Designated (Fixed) Area Hot Work Permit

- a. A Designated (Fixed) Area Hot Work Permit (Appendix D) must be completed and posted within the shop or work area. The single permit is intended to cover all hot work operations within the fixed shop area. Fixed shop permits may be issued for a maximum of 1 year. Designated (Fixed) Area Hot Work Permits are only for areas with controls in place to prevent conditions from changing; otherwise, a daily permit is needed.
- b. Shops that perform hot work activities should be located in noncombustible or fire resistant structures, unless permitted by SUNY Cortland EH&S.
- c. The designated area or shop must be located in a sprinklered portion of the facility, unless permitted by SUNY Cortland EH&S.
- d. Hot work operations shall not be permitted while sprinkler protection is out of service.
- e. The designated (fixed) shop area shall be free of all hazards, as outlined within this section
- f. The area or shop boundary must be constructed to prevent sparks and/or slag migration outside the approved area, or the immediate space surrounding the defined hot work area must be kept clear of all combustibles for the required safe distance. **See table in section 5.b.** for these distances.
- g. Unconnected gas cylinders stored in the area or shop must be limited to a 1-day supply.
- h. The shop supervisor or individual responsible for the hot work area must request a new inspection and permit whenever the configuration and/or occupancy of the fixed hot work area are changed, or the permit is about to expire.
- i. At least one ABC dry chemical fire extinguisher, which is rated minimum 2A:20-BC, shall be located within the fixed hot work area.

7. Operations Not Requiring Hot Work Permit

Operations that produce a flame, sparks, hot slag or enough heat to ignite combustible materials should be considered hot work with a few exceptions. The following operations do not require a Hot Work Permit:

- Bunsen burners in laboratories
- Fixed grinding wheels
- Electric soldering irons for electronics repair
- Cooking operations

All operations that produce open flame, hot sparks, or metals that could ignite combustible materials should be handled with care and treated with fire safety in mind.

If you are unsure if an operation is considered hot work, please contact Environmental Health & Safety at (607) 753-2508.

8. Special Precautions

8.1 Work Stoppage

When work is stopped for an extended periods of time, the equipment must be shut down and secured to prevent accidental sparking. If the work stoppage will exceed the original duration time of the Hot Work Permit, the requestor must notify SUNY Cortland EH&S to have the permit extended or to request issuance of a new permit.

8.2 Pipes

Prior to cutting or welding on pipes, the operator must ensure the pipes are purged and empty. Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings or roofs shall not be undertaken if the work is close enough to cause ignition by conduction.

8.3 Confined Space

If hot work activities are to take place in a confined space, the operator must be trained under and follow all components of the SUNY Cortland Confined Space Entry Program.

Prior to hot work in a confined space, the following precautions must be addressed:

- a. Ensure a confined space entry permit is completed.
- b. Ensure all openings/covers are open and secured from closing.
- c. Test atmosphere within the confined space for carbon monoxide (CO), oxygen (O₂), lower explosive limit (LEL) and hydrogen sulfide (H₂S).
- d. Isolate lines and maintain vents open and valves leak-free.
- e. Lockout/Tagout all systems not required during work.
- f. Provide means for readily turning off power, gas and other supplies from outside the confined space.
- g. Protect or remove any hazardous materials which may become hazardous when exposed to hot work.
- h. Ventilation within the confined space must be supplied to ensure fumes and gases do not exceed exposure limits, and oxygen limits remain within an acceptable range.
- i. If ventilation is not possible, the operators must be provided airline respirators or a self-contained breathing apparatus to ensure safe respirable air at all times. Respiratory protection users must have medical clearance and be included in a written respiratory protection program that complies with OSHA 29 CFR 1910.134.
- j. Gas cylinders and welding machines must be left outside the confined space and secured to prevent movement during hot work operations.
- k. Where an operator must enter a confined space through a manhole or other small opening, means must be provided to quickly remove (rescue) the operator in an emergency.

- l. When breaks in hot work occur, all valves must be turned off and hoses and connections must be disconnected at the power source.

8.4 Containers

No hot work is to be performed on any drums, tanks, containers or any vessel that may have contained chemicals or materials that when heated may produce flammable, explosive, or toxic atmospheres, if the container has not been thoroughly cleaned and prepared.

All hollow spaces, cavities, or containers must be vented during the hot work to permit the escape of air and gases. Purging with inert gas is recommended.

8.5 Hot Tapping

Hot work that must be performed on any utility piping used for the transmission or distribution of flammable gases or liquids shall only be performed by a crew qualified to make hot taps.

9. Personal Protective Equipment

All personnel performing hot work, and any personnel assigned to the hot work project as assistants must be provided appropriate personal protective equipment (PPE).

9.1 Eye, Face, and Head Protection

Any persons who might be exposed to ultraviolet light (UV) generated by welding must wear eye protection with filter lenses specifically designated for the type of welding they are doing. Filter lens recommendations for goggles, helmets and hand shields are shown in Appendix E.

Personnel must contain any long hair under PPE.

9.2 Protective Clothing

Heat resistant clothing must be provided and worn by operators during hot work operations. Clothing should be kept reasonably clean, as oil and grease can reduce its protective qualities and could be flammable. Frayed clothing is particularly susceptible to ignition and must not be worn when performing hot work.

Sleeves should be rolled down and collars kept buttoned. Pockets should be eliminated or protected by leather aprons or welding jackets worn over clothing. If pockets are worn, they should be emptied of combustible materials. Trousers should overlap shoe tops and ankles to prevent spatter from getting into shoes. Work boots that cover the ankle are preferable to low-rise shoes.

9.3 Gloves

All welding and cutting must be conducted wearing flame resistant and electrically nonconductive gloves that allow adequate dexterity for manipulation of the welding equipment and controls in addition to weld-filler rods. Gloves must be in good repair with no holes or frayed seams and free of oil or water residue. Gloves

must cover the cuff of long-sleeved shirts, fit snugly around the forearm and preferably protect up to mid-forearm in length.

9.4 Respiratory Protection

Respiratory protection is needed when ventilation is not sufficient to remove welding fumes or when there is risk of oxygen deficiency.

Fumes and gas hazards to be considered prior to conducting hot work are:

- Fumes (metals) – Aluminum, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Titanium, Vanadium and Zinc;
- Shielding gases – Argon, Helium, Nitrogen, Carbon Dioxide; and
- Process gasses – Nitric Oxide, Nitrogen Dioxide, Carbon Monoxide, Ozone, Phosgene, Hydrogen Fluoride, and Carbon Dioxide.

SUNY Cortland personnel wearing respiratory protection must be enrolled in the SUNY Cortland Respiratory Protection Program. Only respirators approved by EH&S and specific to the hot work hazards may be worn. The SUNY Cortland Respiratory Protection Program requires medical clearance, as well as fit-testing and training by EH&S on respirator care and use. Annual medical clearance and fit-testing may be required for every person enrolled in the SUNY Cortland Respiratory Protection Program.

Contact EH&S at (607) 753-2508 to enroll personnel in the Respiratory Protection Program.

Contractors should have a written respiratory protection program that complies with OSHA 29 CFR 1910.134, and workers shall be cleared to wear respiratory protection via medical evaluation and successful fit test per OSHA regulations. Contractors are responsible for determining the level of PPE to protect their workers from exposures.

9.5 Hearing Protection

Hearing protection must be used where high noise hazards exist. Use fire resistant ear muffs where sparks or splatter may enter the ear, rather than plugs.

10. Vehicle Repair, Special Precautions

Motor vehicles and similar equipment frequently require repairs that involve hot work and the combustible materials inherent to the vehicle / equipment construction cannot be easily removed or relocated to greater than 35 feet. In these cases, a vehicle work area may be identified as a Designated (Fixed) Hot Work Area in accordance with SUNY Cortland Hot Work Program procedure contingent on implementing the following Safe Work Practices to minimize the hazards, as applicable to the work conducted.

Vehicle Repair Safe Work Practices flyer for posting in vehicle / equipment repair facilities is included in Appendix F.

Whenever hot work is performed on a Vehicle in a Designated (Fixed) Hot Work Area,

- a. Check authorized Hot Work Area to ensure all combustibile materials are removed or properly shielded.
- b. Inspect contents of vehicle. Remove readily flammable and ignitable materials from inside of vehicle.
- c. If readily accomplished, remove combustibile components from the vehicle prior to welding.
- d. To the extent possible, use shielding or fire resistive blankets to minimize the heat and sparks reaching flammable or combustibile materials that cannot be readily removed from the vehicle.
- e. Remove any combustibile materials that are in contact with a metal surface that is at the point of the hot work operation.
- f. If proximity to gas tank or lines does not allow for sufficient shielding to prevent heat buildup on the tank and lines, remove the susceptible item, ventilate residual combustibile vapors and ensure that the area is free of combustibile vapors before proceeding.
- g. Assign a qualified person to perform all responsibilities of a Fire Watch for all torch operations and, for other hot work, in locations where other than a minor fire might develop.

Never weld directly on tanks, lines, or hoses.

11. Training Records, Record Retention, and Revisions

11.1 Training Records

EH&S maintains all training records for SUNY Cortland Personnel. Training records will be reviewed annually to ensure compliance with this program.

Contractors must maintain required training records for any contractors performing hot work in SUNY Cortland properties. These records should be available for SUNY Cortland review upon request.

11.2 Record Retention

All Hot Work Permits and Inspection Checklists will be maintained in the EH&S office for a period of one year.

11.3 Revisions

The Hot Work Program will be reviewed annually, and changes will be made should any deficiencies be identified during the annual review.

Updates to codes, rules or regulations will also trigger a review of the Hot Work Program.

Appendix A – Hot Work Permit

HOT WORK PERMIT

Seek an alternative / safer method if possible

Before initiating hot work, ensure precautions are in place as required by NFPA 51B and ANSI Z49.1

Make sure an appropriate fire extinguisher is readily available.

Hot Work Permit is required for any operations that involve open flames or producing heat and/or sparks. This work includes, but is not limited to, welding, brazing, cutting, grinding, soldering, thawing, torch-applied roofing, or chemical welding.

The Following Section to be Completed by the Requestor

Date _____	Hot Work By: <input type="checkbox"/> Employee <input type="checkbox"/> Contractor
Location / Building and Floor _____	
Work to be done _____	

The Following Section to be Completed by the Permit Authorizing Individual

Y	NA	
<input type="checkbox"/>	<input type="checkbox"/>	Available sprinklers, hose streams, and extinguishers are in service and operable.
<input type="checkbox"/>	<input type="checkbox"/>	Hot work equipment is in good working condition in accordance with manufacturer's specifications.
<input type="checkbox"/>	<input type="checkbox"/>	Special permission obtained to conduct hot work on metal vessels or piping lined with rubber or plastic.
Requirements within 35 ft (11 m) of hot work		
<input type="checkbox"/>	<input type="checkbox"/>	Flammable liquid, dust, lint, and oily deposits removed.
<input type="checkbox"/>	<input type="checkbox"/>	Explosive atmosphere in area eliminated.
<input type="checkbox"/>	<input type="checkbox"/>	Floors swept clean and trash removed.
<input type="checkbox"/>	<input type="checkbox"/>	Combustible floors wet down or covered with damp sand or fire-resistive/non-combustible materials or equivalent.
<input type="checkbox"/>	<input type="checkbox"/>	Personnel protected from electrical shock when floors are wet.
<input type="checkbox"/>	<input type="checkbox"/>	Other combustible storage materials removed or covered with listed or approved materials (welding pads, blankets, or curtains; fire-resistive tarpaulins, metal shields, or non-combustible materials.
<input type="checkbox"/>	<input type="checkbox"/>	All wall and floor openings covered.
<input type="checkbox"/>	<input type="checkbox"/>	Ducts and conveyors that might carry sparks to distant combustible material covered, protected, or shut down.
Requirements for hot work on walls, ceilings, or roofs		
<input type="checkbox"/>	<input type="checkbox"/>	Construction is noncombustible and without combustible coverings or insulation.
<input type="checkbox"/>	<input type="checkbox"/>	Combustible material on other side of walls, ceilings, or roofs is moved away.
Requirements for hot work on enclosed equipment		
<input type="checkbox"/>	<input type="checkbox"/>	Enclosed equipment is cleaned of all combustibles
<input type="checkbox"/>	<input type="checkbox"/>	Containers are purged of flammable liquid/vapor
<input type="checkbox"/>	<input type="checkbox"/>	Pressurized vessels, piping, and equipment removed from service, isolated, and vented.
Requirements for hot work fire watch and fire monitoring		
<input type="checkbox"/>	<input type="checkbox"/>	Fire watch is provided during and for a minimum of 30 min. after hot work, including any break activity.
<input type="checkbox"/>	<input type="checkbox"/>	Fire watch is provided with suitable extinguishers and, where practical, a charged small hose.
<input type="checkbox"/>	<input type="checkbox"/>	Fire watch is trained in use of equipment and in sounding alarm.
<input type="checkbox"/>	<input type="checkbox"/>	Fire watch can be required in adjoining areas, above and below.
<input type="checkbox"/>	<input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/> Per the EH&S, PAI, or Fire Watch, monitoring of hot work area has been extended beyond the 30min. MONITOR FOR: _____
Other Precautions Taken: _____		

The Following Section to be Completed by the Permit Authorizing Individual (PAI)

I verify that the above location has been examined, the precautions marked on the checklist above have been taken and Hot Work can begin.		
_____ PRINT NAME (PERSON PERFORMING PRE-INSPECTION (PAI))	_____ SIGNATURE	_____ DATE / TIME

The Following Section to be Completed by the Person Performing Hot Work

_____ PRINT NAME (PERSON PERFORMING HOT WORK)	_____ SIGNATURE	_____ DATE / TIME
--	--------------------	----------------------

THIS PERMIT IS GOOD FOR ONE DAY ONLY		
HOT WORK START TIME	<input type="text"/>	HOT WORK COMPLETION TIME <input type="text"/>

The Following Section to be Completed by the Person Performing Fire Watch at the end of Fire Watch

I verify that the work area and all adjacent areas to which sparks and heat might have spread were inspected during the watch period and were found fire safe.		
_____ PRINT NAME (PERSON PERFORMING FIRE WATCH)	_____ SIGNATURE	_____ DATE / TIME

Environmental Health & Safety Representative Issuing Hot Work Permit	_____ NAME (PRINT) AND SIGNATURE
--	-------------------------------------



WARNING

HOT WORK IN PROGRESS

DO NOT ENTER

IN CASE OF EMERGENCY:

CALL: Cortland County 911 Communications Center _____

AT: 911 _____

OTHER INSTRUCTIONS: _____

EXAMPLE



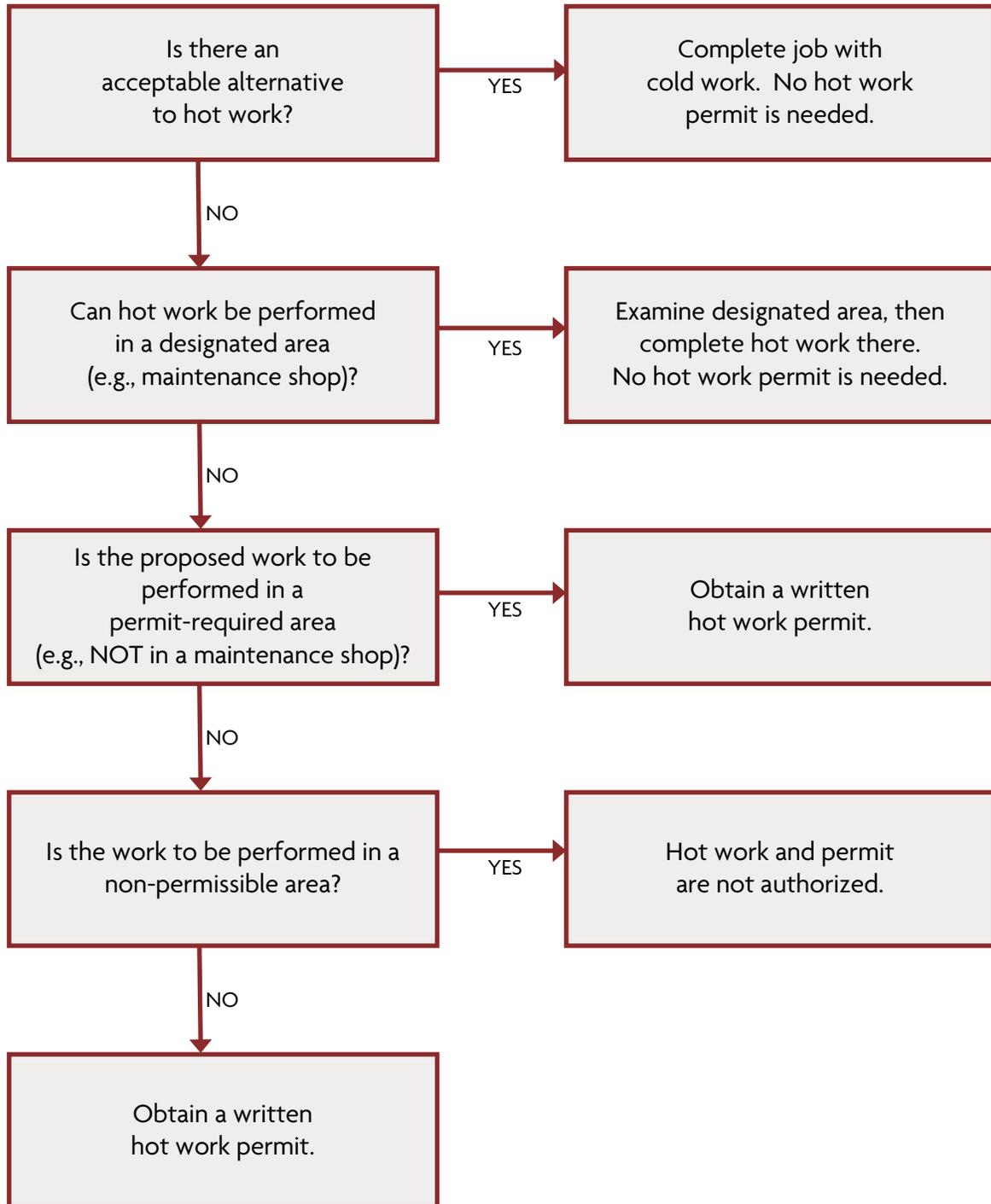
**SUNY CORTLAND
ENVIRONMENTAL HEALTH
AND SAFETY OFFICE**

Environmental Health and Safety
Service Group, Room 108
P.O. Box 2000
Cortland, NY 13045-0900
Office: 607-753-2508

Appendix B – Hot Work Decision Tree

Hot Work Decision Tree

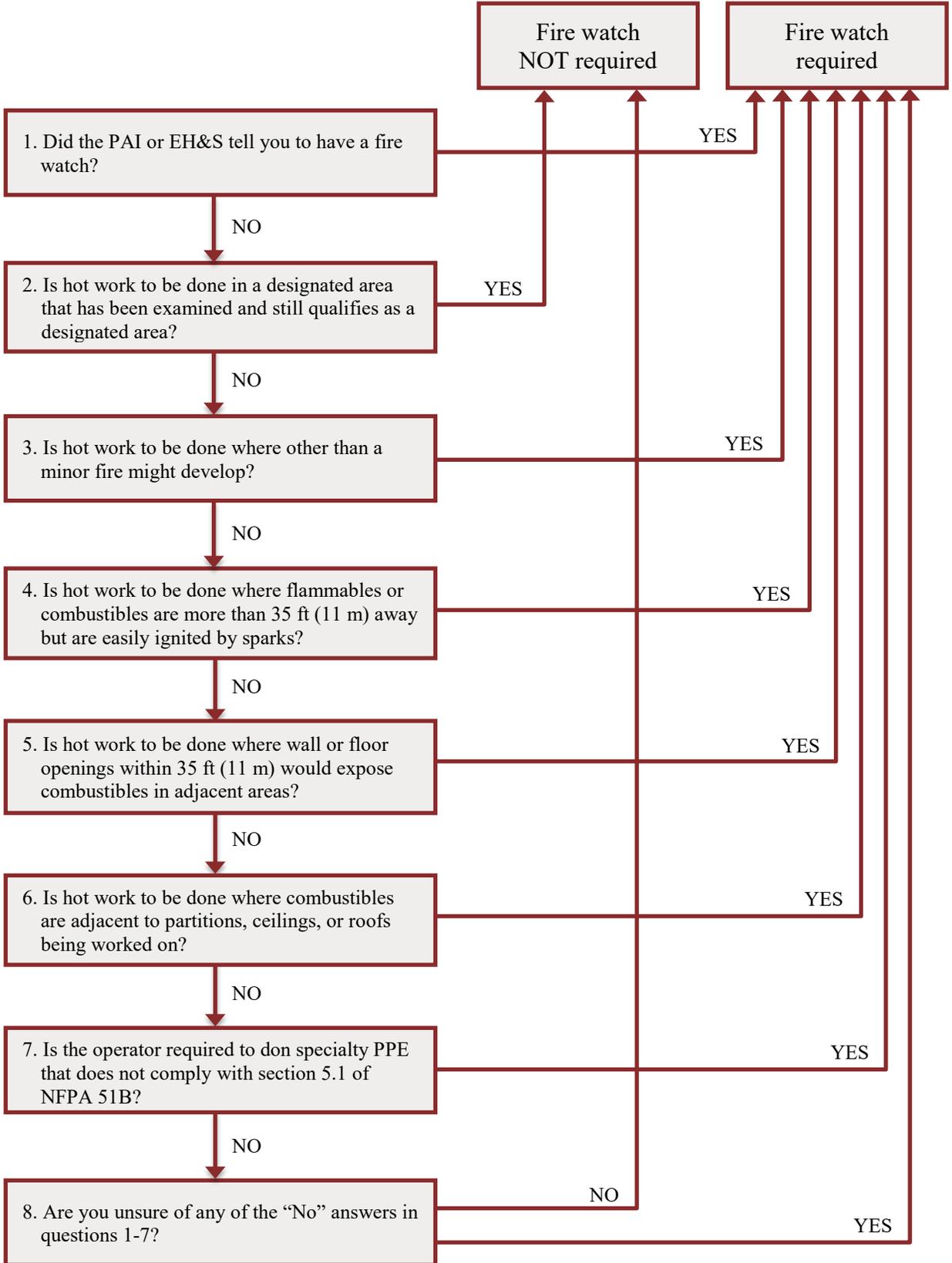
NFPA 51B 2019 Edition



Appendix C – Fire Watch Decision Tree

Fire Watch Decision Tree

NFPA 51B 2019 Edition



Appendix D – Lens Shade Recommendations for Protection Against Radiant Energy

Lens Shade Recommendation for Protection Against Radiant Energy

Welding Operation	Shade Number
Shielded metal-arc welding 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	10
Gas-shielded arc welding (nonferrous) 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	11
Gas-shielded arc welding (ferrous) 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	12
Shielded metal-arc welding 3/16-, 7/32-, 1/4-inch diameter electrodes	12
Shielded metal-arc welding 5/16-, 3/8-inch diameter electrodes	14
Atomic hydrogen welding	10-14
Carbon-arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 to 6 inches	4 or 5
Heavy cutting, more than 6 inches	5 or 6
Gas welding (light), up to 1/8-inch	4 or 5
Gas welding (medium), 1/8- to 1/2-inch	5 or 6
Gas welding (heavy), more than 1/2-inch	6 or 8

Source: 29 CFR 1926.102(c)(1)

Appendix E – Designated (Fixed) Area Permit Example

HOT WORK DESIGNATED (FIXED) AREA PERMIT
GENERAL INSTRUCTIONS

Summary

The Hot Work Designated (Fixed) Area Permit Form is to be issued only for permanent hot work areas that comply with all applicable fire protection regulations. Hot Work associated with construction repairs and other activities/sites with changing conditions require a Daily Hot Work Permit. Changes in the configuration and/or occupancy of the fixed hot work area shall void this permit. The Hot Work Area Supervisor is responsible for the fixed hot work location. He/She is responsible for requesting a valid permit before the currently issued permit expires or if the designated hot work location/operation is modified.

The Hot Work Area Supervisor and Permit Authorizing Individual (PAI) shall inspect the fixed hot work area to verify all precautions have been taken before signing off on the permit. The permit is void unless signed copies of the fixed hot work permit have been appropriately distributed to the respective Building / Facility Manager and Safety Coordinator by the PAI. The Hot Work Area Supervisor will return all void and/or expired permits to the issuing PAI. All fixed hot work permits must be visibly posted in the fixed hot work area.

Purpose

This permit is to be used for fixed hot work areas which comply with all applicable fire protection regulations.

Reference: SUNY Cortland Hot Work Program

Completing the Form

1. Name of building, department, and requestors name and contact information.
 - First and last name, phone number with area code (xxx-xxx-xxxx).
 - Provide emergency phone number (xxx-xxx-xxxx).
2. Exact Location of Work Area – Provide additional information for location.
3. Type of Hot Work – Type of hot work will dictate the required inspection distance in the checklist as follows:

Welding	35 ft.	Brazing	15 ft.
Grinding	35 ft.	Soldering	10 ft.
Cutting	35 ft.	Other	35 ft.

These distances are measured from the point where hot work is being conducted. Conditions of the area within the designated inspection distance must comply with the precautions listed in Item 6.

4. Permit Start Date / Permit Expiration Date – Permit expires one (1) year from start date.
5. Provide additional comments as necessary.
6. Required Precautions Checklist – The Permit Authorizing Individual (PAI) and Hot Work Supervisor shall use the list and check those that are appropriate (YES or N/A). The permit is **NOT** to be signed unless all items listed are marked as either "YES" or "N/A."
7. Permit Authorizing Individual (PAI) and Hot Work Supervisor will provide first, last name (print), signature, and date. Visibly post permit in work area and return all void and/or expired permits to the Environmental Safety and Health Office. PAI to distribute signed copies of the permit to the Facilities Manager, Department Office, and Environmental Health and Safety Office.



**SUNY CORTLAND
ENVIRONMENTAL HEALTH
AND SAFETY OFFICE**

Environmental Health and Safety
Service Group, Room 108
P.O. Box 2000
Cortland, NY 13045-0900
(607) 753-2508

HOT WORK DESIGNATED (FIXED) AREA PERMIT

The Following Section to be Completed by the Requestor

1 NAME OF BUILDING AND CONTACT NUMBER	EMERGENCY PHONE #
Building	
Department	Department Phone
Requested by	Requestors Phone

The Following Section to be Completed by the Requestor

2 EXACT LOCATION OF WORK AREA (Specific Area Name & Room # and/or Exterior Location)

The Following Section to be Completed by the Requestor

3 TYPE OF HOT WORK

HOT WORK PERMIT DURATION CANNOT EXCEED ONE (1) YEAR FROM ISSUE DATE

4

PERMIT START DATE

PERMIT EXPIRATION DATE

This fixed shop hot work area complies with all applicable fire protection regulations. Changes in the configuration and/or occupancy of the fixed hot work area **SHALL** void this permit. The Hot Work Area Supervisor is responsible for the fixed hot work location. The Hot Work Area Supervisor is responsible for requesting a valid permit before the currently issued permit expires or if the designated hot work location is modified. In the event of a fire system impairment, the hot work must be discontinued for the duration of the impairment.

The Following Section to be Completed by the Permit Authorizing Individual or Requestor

5 Additional Comments

The Following Section to be Completed by Hot Work Area Supervisor and PAI

Required Precautions Checklist – The Following Precautions Have Been Taken		Supervisor			PAI		
		YES	NO	N/A	YES	NO	N/A
A	Portable firefighting equipment readily available and nearest phone and fire alarm box identified	<input type="checkbox"/>					
B	Hot work equipment is in good repair and personnel protective equipment will be used during hot work	<input type="checkbox"/>					
C	Flammable liquids, dust, lint, and oil deposits are removed within 35 ft. of operation	<input type="checkbox"/>					
D	Combustibles have been removed where possible and/or items are protected with fire resistant tarps and/or shields	<input type="checkbox"/>					
E	All wall and floor openings are covered within 35 ft. of operations and fire resistant tarps will be used beneath work area	<input type="checkbox"/>					
F	Construction is noncombustible or protected	<input type="checkbox"/>					
G	Ample ventilation is available to remove smoke / vapor from the work area and will be discharged to a safe location	<input type="checkbox"/>					
H	All compressed gas cylinders have been moved to a safe location	<input type="checkbox"/>					
I	Chemical hazards have been evaluated (coatings, paint, cleaners, fumes, etc.) and removed	<input type="checkbox"/>					

The Following Section to be Completed by the Hot Work Area Supervisor and the Permit Authorizing Individual

7 I verify the above location has been examined, and the precautions checked on the required precautions checklist have been taken to prevent fire and permit hot work in the above designated area.

HOT WORK MAY BEGIN AFTER IT HAS BEEN VERIFIED THAT ABOVE CONDITIONS HAVE BEEN MET, PERMIT SIGNED FOR APPROVAL AND POSTED AT HOT WORK SITE. COPIES OF THIS PERMIT HAVE BEEN DISTRIBUTED TO ENVIRONMENTAL HEALTH AND SAFETY OFFICE, BUILDING MANAGER, AND DEPARTMENT OFFICE

Yes or N/A box must be checked for every item in Section 6 before signing this permit

Appendix F – Vehicle Repair Safe Work Practices

VEHICLE REPAIR

SAFE WORK PRACTICES

Motor vehicles and similar equipment frequently require repairs that involve hot work and the combustible materials inherent to the vehicle/equipment construction cannot be easily removed or relocated to greater than 35 feet. In these cases, a vehicle work area may be identified as a Designated (Fixed) Hot Work Area in accordance with SUNY Cortland Hot Work Program procedure contingent on implementing the following Safe Work Practices to minimize the hazards, as applicable to the work conducted.

Whenever hot work is performed on a Vehicle in a Designated (Fixed) Hot Work Area,

FIRST:

Check authorized Hot Work Area to ensure all combustible materials are removed or properly shielded.

Inspect contents of vehicle. Remove readily flammable and ignitable materials from inside of vehicle.

If readily accomplished, remove combustible components from the vehicle prior to welding.

To the extent possible, use shielding or fire resistive blankets to minimize the heat and sparks reaching flammable or combustible materials that cannot be readily removed from the vehicle.

Remove any combustible materials that are in contact with a metal surface that is the point of the hot work operation.

If proximity to gas tank or lines does not allow for sufficient shielding to prevent heat buildup on the tank and lines, remove the susceptible item, ventilate residual combustible vapors and ensure that the area is free of combustible vapors before proceeding.

Assign a qualified person to perform all responsibilities of a Fire Watch for all torch operations and, for other hot work, in locations where other than a minor fire might develop.

NEVER:

Weld directly on tanks, lines, or hoses.



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