CSN Procedure		Facilities Management
Category: Environmental Hea	alth and Safety	Effective Date: 02/01/2024
Hot Work Program		

I. PURPOSE

The purpose of this program is to establish the minimum requirements and procedures for preventing fires that may result from hot work performed at the College of Southern Nevada (CSN) properties. This program also establishes the basic requirements for the issuance of hot work permits.

II. SCOPE

This procedure applies to all college departments, employees, and contractors involved in hot work operations that use an open flame or generate sparks, such as grinding, cutting, brazing, soldering, thawing frozen pipes by torch, torch-applied roofing, and welding.

Hot work does not generally include candles, cooking operations, pyrotechnics, electric soldering irons, and Bunsen burners used in the laboratory setting. Note: Some open flame activities not covered under the hot work program such as candles, Sterno solid fuel canisters, or pyrotechnics require review and approval from the Nevada State Fire Marshal prior to use on campus.

III. DEFINITIONS

Fire Watch: A temporary measure intended to ensure continuous and systematic surveillance of a building or portion thereof by one or more qualified individuals for the purpose of identifying and controlling fire hazards, detecting early signs of unwanted fire, raising an alarm of fire, and notifying the fire department.

Fire Monitoring: A temporary measure intended to continue surveillance after the post-work fire watch is complete. Methods of monitoring may include automatic smoke detection with remote alarm, security cameras, operators routinely present in the hot work area, and/or intermittent patrols by personnel (e.g., every 15 minutes).

Hot Work: Any temporary operation involving open flames or producing heat and/or sparks. This includes, but is not limited to, grinding, cutting, brazing, soldering, thawing frozen pipes by torch, torch-applied roofing, and welding.

Hot Work Permit: A document obtained through approval from CSN Environmental Health and Safety Department (EHS) for hot work outside of a permanently established hot work area and must be kept onsite of the work until the work is completed.

Permanently Established Hot Work Area: A specific location designed and approved for hot work operations that is maintained fire-safe, such as a maintenance shop, welding laboratory, or detached outside location.

IV. PROCEDURE

- A. Responsibilities:
 - 1. CSN Environmental Health and Safety (EHS)
 - Develop, implement, and maintain the CSN Hot Work Program.
 - Provide training on the Hot Work Program and individual responsibilities.

- Provide, when requested, technical support and guidance for planning hot work operations.
- Evaluate and approve permanently established hot work areas.
- Perform periodic inspections of designated and permanent hot work areas.
- Approve or deny hot work permits and maintain completed permits on file.
- 2. CSN Departments
 - Contact EHS to evaluate and approve permanently established hot work areas.
 - Ensure that a hot work permit has been completed and approved by EHS prior to the start of hot work in a non-designated area.
 - Ensure that employees assigned to fulfill hot work duties have completed hot work safety training, fire extinguisher training, and understand the applicable provisions of the CSN hot work program.
 - Ensure that properly trained Fire Watch Attendant(s) are assigned when necessary.
 - Ensure that outside contractors are made aware of the CSN Hot Work Program and that they are expected to fully comply with the National Fire Protection Association (NFPA) and Occupational Safety and Health Administration (OSHA) requirements.
- 3. Hot Work Operations Supervisor
 - Complete hot work safety and fire extinguisher training courses.
 - Prepare hot work permit (Appendix A) for EHS approval prior to the start of hot work in a non-designated area. Ensure that all requirements of the Hot Work Permit are followed.
 - Ensure properly trained fire watch attendant(s) are assigned when necessary. Request additional fire watch attendants for areas with vertical or horizontal fire exposures and combustible materials that are not observable by a single individual.
 - Ensure that proper equipment and supplies are on hand and checked for proper operation:
 - Fully charged fire extinguisher that is appropriate for the possible types of fire.
 - Hot work equipment, shields, and PPE for all hazards.
 - Communications equipment.
 - Conduct briefings, for all hot work participants, that summarize the permit, potential hazards, protective measures, and any additional relevant issues related to the project.
 - Return completed and closed-out hot work permit to EHS.
- 4. Individual Performing Hot Work (Worker)
 - Complete hot work safety and fire extinguisher training courses.
 - Ensure the hot work permit is approved and posted prior to start of work, if required. Follow all requirements listed on the permit.
 - Perform a hot work check prior to work ensuring:
 - All equipment is in safe operational condition.
 - All hazards within the hot work area are protected from heat and/or flames.
 - All combustibles within 35 feet are removed from the vicinity of the work or adequately covered.
 - Action has been taken to prevent accidental activation of the fire suppression and/or detection equipment in accordance with 2018 IFC 3504.1.9.
 - Automatic sprinkler protection system shall not be shut off while hot work is being performed unless otherwise approved by EHS and the fire code official.
 - Notify the Hot Work Operations Supervisor if conditions change or warrant a reassessment of the hot work project.
 - Use equipment properly and safely.
 - Use appropriate personal protective equipment (PPE) while performing hot work

operations (welding helmets, gloves, jackets, etc.).

- Place warning sign(s) if the work area is accessible to other personnel.
- Return the permit to the Hot Work Operations Supervisor after the work and fire watch/ monitoring is complete.
- 5. Fire Watch Attendant
 - Complete hot work safety and fire extinguisher training courses.
 - Have no other duties other than performing fire watch.
 - Ensure that appropriate fire extinguishers are readily available within 30 feet of hot work operations.
 - Have reliable communication devices readily available to report emergencies.
 - Ensure safe conditions are maintained during and immediately after the hot work by inspecting for stray sparks or other fire hazards.
 - Wear appropriate personal protective equipment (PPE) for the hazards present.
 - Be familiar with the facilities where hot work will be done and the methods for sounding the alarm in the event of a fire.
 - Notify the Hot Work Worker and Operations Supervisor if conditions change or warrant reassessment of the hot work project.
 - Maintain continuous fire watch after the hot work is completed. Refer to Table 1 for the post-work fire watch period.
- 6. CSN Facilities Management Project and Construction Managers
 - Ensure that outside contractors are made aware of the CSN Hot Work Program and that they are expected to fully comply with National Fire Protection Association (NFPA) and Occupational Safety and Health Administration (OSHA) requirements while on CSN property.
 - Review the contractor's Hot Work Program to ensure that it is adequate for the type of work being performed.
 - When hot work is required, coordinate with the contractor to notify CSN EHS prior to the start of hot work.
- 7. Contractors/Vendors Performing Hot Work at CSN
 - Must have adequate training on the use/maintenance of equipment used for hot work.
 - Must supply their own hot work equipment, approved fire extinguishers, signage/barricades, and personal protective equipment (PPE).
 - Notify EHS through the project or construction manager of any hot work to be conducted on CSN property (or other areas of CSN responsibility) at least 24 hours prior to the start of hot work.
 - Implement their company's hot work permit program as required by NAC 618.5315 and comply with NFPA and OSHA requirements. The contractor shall designate their own qualified permit authorizing individual(s).
 - If needed, the contractor may use CSN's how work permit (Appendix A) and EHS can serve as the permit authorizer.
 - Ensure that all conditions of the hot work permit are met during and after the hot work.
 - Hot work permits must be maintained on location during the work. Contractor/vendor must retain copies of hot work permits for the duration of the project and have them available should a CSN Project Manager, Facilities Leadership, EHS, or regulatory agency request copies.

Unless otherwise specified at the beginning of this procedure, printed copies of this procedure are UNCONTROLLED. Always ensure prior to use you are using the most current copy.

- B. Hot Work Areas
 - 1. Permanently Established Hot Work Areas
 - Permanent hot work areas must meet the following criteria:
 - Noncombustible or of fire-resistant construction.
 - Free of combustible and flammable contents.
 - Suitably segregated from adjacent areas.
 - Classrooms, laboratories, and academic vocational shops that are designed and equipped for hot work operations are considered approved permanent hot work areas. EHS will inspect these designated academic areas once per year.
 - Hot work activities are permitted at any time in permanently established areas without a hot work permit if:
 - o Conditions are appropriate and proper safety precautions are taken; and
 - The individual performing hot work is trained and qualified; and
 - The Hot Work Operations Supervisor approves the work.
 - For academic spaces, a qualified instructor must be present in the area.
 - EHS shall inspect and approve the area's designation as a permanent hot work area using the checklist in Appendix B.
 - A list of approved designated hot work areas can be obtained from CSN EHS.
 - 2. Permit Required Hot Work Areas:
 - When hot work is performed outside of a permanently established area, a hot work permit must be obtained prior to the start of work.
 - The permit is valid until the job is complete or conditions change (i.e., shift change).
 - If a project will require multiple days/weeks of hot work, special arrangements can be made through EHS to issue Hot Work permits for a designated timeframe (e.g., one week at a time) or the length of the project, at the discretion of EHS. Additional requirements may apply (e.g., routine inspections and/or a daily log maintained).
 - Hot work performed inside any enclosed or confined space requires additional precautions. Employees shall follow the requirements outlined in the CSN Confined Space Entry Program.
 - 3. Prohibited Hot Work Areas
 - Areas where the sprinkler system is impaired (2018 IFC 3501.3). When hot work cannot be avoided during a sprinkler impairment, contact EHS who will consult with CSN's insurance carrier and/or the fire code official prior to the start of work.
 - Areas where the potential for an explosive atmosphere exists, such as locations where flammable gases, liquids, or vapors are present (2018 IFC 3501.3).
 - Areas with readily ignitable materials, such as storage of large quantities of bulk sulfur, baled paper, cotton, lint, dust, or loose combustible materials (2018 IFC 3501.3).
 - Hot work shall not be attempted on a partition, wall, ceiling, or roof that has a combustible covering or insulation, or on walls or partitions of combustible sandwich type construction (NFPA 51B, Section 5.4.2 (8)).
 - Hot work that is performed on pipes or other material that is in contact with combustible walls, partitions, ceilings, roofs, or other combustibles shall not be undertaken if the work is close enough to cause ignition by conduction (NFPA 51B, Section 5.4.2 (9)).
 - At other locations as specified by the fire code official (2018 IFC 3501.3).

- C. Hot Work Operations
 - 1. Prior to Hot Work
 - Obtain a hot work permit if work is to occur outside of a permanently established hot work area. To obtain a permit, the Hot Work Operations Supervisor or designee shall:
 - Notify EHS of hot work at least 24 hours in advance, if possible.
 - Inspect the area where work is to occur.
 - Complete the permit in Appendix A and submit it to the EHS representative at the respective campus where the work will occur. EHS will review and sign as the permit authorizer.
 - Permit requests may also be submitted electronically to EHS at: <u>https://csn.campusoptics.com/pr/hot-work</u>
 - Ensure all equipment is in good operating order.
 - Inspect area and remove flammable and combustible materials within a 35-foot radius of the hot work area. Properly shield combustibles that cannot be removed from the area with approved curtains or guards.
 - Determine if a Fire Watch Attendant is required. Fire watch must be used when:
 - Combustibles within 35 feet of the operations cannot be relocated or adequately protected in place.
 - A significant amount of combustible material is more than 35 feet away but can easily be ignited by sparks.
 - Combustible materials are adjacent to the opposite side of partitions, walls, ceilings, or roofs and could be ignited by conduction or radiation.
 - Ensure that sprinkler heads and smoke detectors in close proximity to the hot work area are covered prior to the start of work to prevent unwanted alarms.
 - Protect gas lines and equipment from falling sparks, hot materials, and objects.
 - Seal all cracks and openings through which hot sparks or slag may enter or use a fireresistant shield to block the openings.
 - Sweep the floor of all combustible debris and remove grease and oils.
 - Ensure the appropriate fire extinguishers are available and easily accessible.
 - Ensure appropriate PPE, shields, and communication devices are available at the site.
 - Post permit (if required) and signs to mark the hot work area and warn nearby personnel of the hot work.
 - 2. During Hot Work
 - Maintain appropriate fire extinguishers and communication equipment near the hot work area.
 - Perform continuous fire watch over the hot work area, when required.
 - Store acetylene and other fuel cylinders in a secure and upright position at least 20 feet from highly combustible materials. Place hoses so that they will not be crushed or damaged.
 - Be constantly aware of conditions that may cause a fire to start.
 - Conduct periodic inspections and stop work if hazardous conditions are found.
 - 3. After Hot Work
 - Remove covers from sprinkler heads and/or smoke detectors immediately after completion of the hot work.
 - Inspect the area following the completion of work to ensure that any hot work sparks have been extinguished.
 - Perform continuous fire watch after hot work is complete, when required. Refer to Table 1 for the post-work fire watch period.

- After the post-work fire watch has concluded, perform fire monitoring within the hot work area. Use one of the monitoring methods below and refer to Table 1 for the fire monitoring period.
 - Automatic smoke detection system with remote alarm.
 - Security video cameras with clear coverage of the hot work area.
 - Operators routinely present in the hot work area.
 - Personnel to intermittently patrol the hot work area for fire-safe conditions. At a minimum, patrol the hot work area at least every 15 minutes.
- Keep fire-extinguishing equipment readily accessible in the area until fire watch and monitoring duties are complete.
- Once the fire watch and monitoring are complete, the Hot Work Operations Supervisor or designee must complete the appropriate closeout section of the hot work permit and return the permit to EHS.

Table 1. FM Global Construction and Occupancy Factors for Determining
Post-Work Fire Watch and Fire Monitoring Periods

	Construction Factors								
		Noncombustible construction or FM Approved Class 1 or Class A bldg. materials		Combustible construction without concealed cavities		Combustible construction with unprotected concealed cavities			
		Watch	Monitor	Watch	Monitor	Watch	Monitor		
Occupancy Factors	Noncombustible with any combustibles contained within closed equipment (e.g., ignitable liquid within piping)	30 min	0 hours	1 hour	3 hours	1 hour	5 hours		
	Office, retail, or manufacturing with limited combustible loading	1 hour	1 hour	1 hour	3 hours	1 hour	5 hours		
	Manufacturing with moderate to significant combustible loading except as noted below	1 hour	2 hours	1 hour	3 hours	1 hour	5 hours		
	Warehousing	1 hour	2 hours	1 hour	3 hours	1 hour	5 hours		
	Exceptions: Occupancies with processing or having bulk storage of combustible materials capable of supporting slow growing fires (e.g., paper, pulp, textile fibers, wood, bark, grain, coal, or charcoal)	1 hour	3 hours	1 hour	3 hours	1 hour	5 hours		

Additional Notes:

When performing torch-applied roofing, apply additional precautions and conduct a minimum 2-hour fire watch and 2 hours fire monitoring. If an infrared camera is utilized, reduce to a 1-hour fire watch and 1-hour fire monitoring.

When performing hot work on/in equipment containing nonremovable combustible linings or parts, apply additional precautions and conduct a minimum 1-hour fire watch and 3 hours fire monitoring within the equipment, and in the surrounding areas per table above.

- D. Training
 - 1. CSN Environmental Health and Safety is responsible for providing Hot Work Safety and Fire Extinguisher training to CSN employees who are required to complete tasks that involve hot work.
 - 2. Training must be conducted before an employee is first assigned and/or assigned new or additional duties as outlined in the Hot Work Program.
 - 3. Re-training shall be provided whenever: 1) the Hot Work Program changes; 2) there is reason to believe there are inadequacies in an employee's knowledge or the Hot Work Program; 3) an employee improperly performs assigned tasks.
- E. Records Management
 - 1. Training records are maintained by the CSN CAPE Learning Management System.
 - 2. Records of hot work permits should be maintained by EHS for three calendar years from the date of completion. Hot work permits on record should be reviewed for program improvement or modification purposes prior to disposal.

V. AUTHORITY AND CROSS REFERENCE LINKS

- 1. 29 CFR 1910, Subpart Q Welding, Cutting, and Brazing
- 2. 29 CFR 1926, Subpart J Welding and Cutting
- 3. Nevada Administrative Code (NAC), 618.5315 Permit for Hot Work
- 4. 2018 International Fire Code Chapter 35, Welding and Other Hot Work
- 5. National Fire Protection Association (NFPA), 51B Standard for Fire Prevention During Welding, Cutting, and Other Hot Work

VI. APPENDICES

Appendix A – CSN Hot Work Permit Appendix B – Permanently Established Hot Work Area Designation Form Appendix C – Summary of Document Revisions



HOT WORI (Work related to heat, flames,	K PERMIT sparks, electrical arcs, etc.)				
Department:	Permit Number:				
Campus:	Work Order No:				
BEFORE STARTING, consider less haz If hot work is performed outside of a	ardous work methods or w designated area, USE THIS	ork off site PERMIT.).		
Work Location:					
Work Description:					
Work Date(s)/Time(s):					
Name of Person Performing Work:		CSN S	taff Contractor		
Work Area Risk Assessment:					
a. Automatic sprinklers are fully operational (see note 1 on bac	k)	NA	🗌 Yes 🗌 No		
b. Hot work equipment is functional, secure, and in good repair			🗌 Yes 🗌 No		
c. First Aid and Fire Extinguisher are operable and available			🗌 Yes 🗌 No		
d. Within 35 ft (10 m) of the work area:					
1) Remove ignitable liquids, combustible dust/lint, and combus	tible residues (floors and ove	erhead)	🗌 Yes 🗌 No		
2) Remove combustible materials or cover with fire resistant pa	ads, blankets, or curtains		🗌 Yes 🗌 No		
3) Protect floor and wall openings against spread of sparks or e	embers		🗌 Yes 🗌 No		
4) Shut down ventilation and conveying systems			🗌 Yes 🗌 No		
d. For Hot work on/in enclosed equipment, ductwork, or piping, complete 1 thru 4:			🗌 Yes 🗌 No		
1) Ventilation is adequate			🗌 Yes 🗌 No		
2) Isolate equipment from service and purge flammable vapors		Yes No			
3) Purging and ventilation is verified with gas detector			Yes No		
4) Thoroughly clean equipment to remove all flammables and combustibles			Yes No		
Fire Watch and Fire Monitoring – Use table on back of permit for guidance on times					
a. Fire watch to be provided continuously during and after hot v		🗌 Yes 🗌 No			
1) Duration of fire watch post-work: 1 hour or Other hours.					
2) Duration of fire monitoring post-work: 3 hours or Other	hours.		_		
Additional Precautions:			NA		
Hot Work Performer (Worker) Print Name:	Signature:				
Fire Watch Attendant Print Name:	Signature:				
Hot Work Operations Supervisor	Signature:				
Authorizer (EHS)	olghatalo.				
Print Name:	Signature:				
Permit Valid Date(s)/Times:					
Permit closed by Hot Work Operations Supervisor:					
Work complete with no hot or smoldering conditions evident					
Impaired/isolated fire detection/protection systems back in	operation NA				
Date: Time:	Signature:				



WARNING – HOT WORK IN PROGRESS WATCH FOR FIRE!

In case of emergency, call the University Police Services 702-895-3669 (cell phone) or 7-911 (campus)

Note: Fire Protection Impairments

- Only smoke detectors should be isolated to avoid unwanted alarms.
- Hot work should NOT be permitted in any area equipped with automatic sprinklers while sprinklers are impaired. Where hot work cannot be avoided during a sprinkler impairment, consult with EHS before proceeding.

Note: Fire Watch

- Maintain an uninterrupted fire watch throughout the work area and adjacent areas.
- This includes lunchtime, breaks, and shift changes.
- After work is completed, maintain a continuous fire watch for at least 60 minutes. Additional time guidelines for fire watch and monitoring are listed in the table below.

FM Global Construction and Occupancy Factors for Determining Post-Work Fire Watch and Fire Monitoring Periods

	Construction Factors							
		Noncombustible construction or FM Approved Class 1 or Class A bldg. materials		Combustible construction without concealed cavities		Combustible construction with unprotected concealed cavities		
		Watch	Monitor	Watch	Monitor	Watch	Monitor	
Occupancy Factors	Noncombustible with any combustibles contained within closed equipment (e.g., ignitable liquid within piping)	30 min	0 hours	1 hour	3 hours	1 hour	5 hours	
	Office, retail, or manufacturing with limited combustible loading	1 hour	1 hour	1 hour	3 hours	1 hour	5 hours	
	Manufacturing with moderate to significant combustible loading except as noted below	1 hour	2 hours	1 hour	3 hours	1 hour	5 hours	
	Warehousing	1 hour	2 hours	1 hour	3 hours	1 hour	5 hours	
	Exceptions: Occupancies with processing or having bulk storage of combustible materials capable of supporting slow growing fires (e.g., paper, pulp, textile fibers, wood, bark, grain, coal, or charcoal)	1 hour	3 hours	1 hour	3 hours	1 hour	5 hours	

Note: When performing torch-applied roofing, apply additional precautions and conduct a minimum 2-hour fire watch and 2 hours of fire monitoring. If an infrared camera is utilized, reduce to a 1-hour fire watch and 1-hour fire monitoring.

Note: When performing hot work on/in equipment containing nonremovable combustible linings or parts, apply additional precautions and conduct a minimum 1-hour fire watch and 3 hours of fire monitoring within the equipment, and in the surrounding areas per table above.



Appendix B – Permanently Established Hot Work Area Designation Form

Permanently Established Hot Work Area Determination Form						
A permanent hot work area is a designated location for hot work. A hot work pe	A permanent hot work area is a designated location for hot work. A hot work permit is NOT required when performing hot work within the designated area.					
Campus:	Building:					
Room Number/Description of Location:						
Instructions: In order for a hot work area to become a designated permanent area, the area must meet the criteria below and be approved by a member of CSN Environmental Health and Safety (EHS).						
1. Is the area constructed of non-combustible and fire resistive material?		Yes 🗌	No 🗌			
2. Is the area essentially free of combustible and flammable gases, vapors, liquid	ids, and dusts?	Yes 🗌	No 🗌			
3. Is the area suitably segregated from adjacent areas?		Yes 🗌	No 🗌			
4. Is working surface for soldering/brazing activities made of non-combustible materials? (i.e. benchtop, table)			No 🗌 NA 🗌			
5. Is the area equipped with the appropriate fire extinguishers?		Yes 🗌	No 🗌			
6. Adequate ventilation is available to remove smoke/vapors from the work area?			No 🗌			
7. All compressed gas cylinders are stored properly?			No 🗌 NA 🗌			
Upon reviewing the items above, this area is approved by CSN Environmental Health and Safety (EHS) as a permanently established hot work area. Yes 🗌 No 🔲						
Comments:						
Printed EHS Employee Name:		Data				
Da EHS Employee Signature:						



Appendix C – Summary of Document Revisions

Date of Review: 01/19/2024			
Section	Change		
111	Added definition for fire monitoring.		
IV(C)1.	Added electronic link to Hot Work Permit.		
IV(C)3.	Added provisions for fire monitoring to the Hot Work Program.		
Table 1.	Added Table 1. FM Global Construction and Occupancy Factors for Determining Post-		
	Work Fire Watch and Fire Monitoring Periods.		
Appendix A	Edited hot work permit and added fire watch and fire monitoring guidance per <i>FM Global</i> recommendations.		
Appendix C	Added Appendix C to document changes to the Hot Work Program.		
All	Minor wording and grammar edits throughout the document.		

		Date of Review:	
Section	Change		
		Date of Review:	
Section	Change		