



NYU WINTHROP HOSPITAL

**Engineering Department
Safety Policy**

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ENGINEERING DEPARTMENT POLICY

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Introduction

NYU Winthrop Hospital is committed to providing a safe, secure, and functional environment of care for patients, visitors, and personnel. All employees are responsible for safety, and this responsibility can only be met if we continuously work together to promote safe work practices, eliminate hazards, reduce risks, maintain property, and equipment, and observe all rules and regulations.

All employees are required to report incidents, unsafe practices, and hazardous conditions to their supervisors. All staff must ensure that processes for identifying, reducing and managing risks are effectively carried out. Supervisors must assure that effective corrective measures are taken, including actions to prevent recurrence.

PURPOSE

The purpose of the NYU Winthrop Hospital Engineering Department Safety Policy is to promote a safe, secure, and functional Environment of Care for patients, visitors, and personnel. This will support efforts to carry out the hospital's mission of providing quality health care, medical education, community service, and research.

Fundamentals for a successful Safety Policy include:

1. Enthusiasm and support from the governing body, Administration, and department directors for a safe environment, which will be transmitted to the employees.
2. Education for all employees to create an atmosphere of safety awareness on the job and to impart an understanding of Hospital rules and regulatory/accreditation requirements.
3. Properly maintain equipment, buildings, and grounds in a safe and functional manner.
4. A risk assessment and surveillance program to identify hazards and risks, and assure timely and appropriate correction of actions.

OBJECTIVES

The objectives of the Safety Policy are to reduce the risk of injury to patients, visitors, and personnel and minimize the likelihood of damage to property and equipment by:

1. Maintaining all buildings, grounds, and equipment in a safe and functional manner.
2. Conducting risk assessments that proactively evaluate the impact of the physical environment and work practices on personnel safety
3. Evaluate safety issues and make appropriate changes to process, environment or equipment
4. Reporting and investigating all incidents of property damage and personnel injuries.
5. Conducting ongoing Environmental Tours and Hazard Surveillance.
6. Providing orientation and routine safety education programs that address the general safety process, area-specific safety, specific job-related hazards, and provisions for continuing education.
7. Conducting on-going monitoring of staff knowledge, skills, and performance.
8. Establishing safety policies and procedures, which are distributed, practiced, enforced, and reviewed as frequently as necessary, but at least once each year.

SCOPE

The Scope of the Engineering Department Safety Policy encompasses the following:

All Engineering Department activities occurring within NYU Winthrop Hospital buildings, grounds, equipment and facilities, both on and off campus.

2. Particular support and assistance will be provided by the following departments:
 - Safety
 - Human Resources
 - Risk Management
 - Materials Management
 - Infection Prevention
 - Security
 - Environmental Services
 - Employee Health Services

MANAGEMENT RESPONSIBILITIES

The Director of Engineering and all shop Managers are key personnel in the success of the Engineering Department Safety Policy. They must be committed to assuring a safe work environment within the department and must immediately act to mitigate any identified potential hazards. In the event that good safety practices are being violated, the Director and/or Managers must take immediate action to rectify the problem, including disciplinary measures, if necessary.

The Director and all Managers must ensure that Hospital safety policies and departmental safety policies are being followed, and pertinent safety information is disseminated throughout the department. The Director and all Managers are responsible for ensuring the safety-related and task-specific training of their staffs upon orientation and at least annually thereafter, and whenever a process, protocol, and/or equipment is changed or modified.

EMPLOYEE RESPONSIBILITIES

The employee should be the person most concerned for his/her own safety. In addition, each employee has certain duties to assure safety on the job, for the general public, patients and other employees. These include:

1. Knowing his/her job and always-applying safe work practices.
2. Recognizing the hazards of the job and taking precautions and actions to assure the safety of himself/herself and others. (Examples: correcting a condition as applicable; notifying a manager; submitting an Engineering Work Order).
3. Informing his/her supervisor of hazards and recommending how to eliminate them or improve safety performance.
4. Actively participating and cooperating in the overall safety program.
5. Maintaining cleanliness and good personal health habits.
6. Attending any educational programs pertaining to safety, which Management deems necessary.

ENGINEERING DEPARTMENT POLICY

	No:	ENG-01 (A)
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1. Introduction

An arc flash hazard (AFH) is defined as a dangerous condition associated with the possible release of energy caused by an electric arc. Employees working on energized electrical equipment, operating at 50 volts or more, have the potential for personal injury from arcing faults by conditions such as tools contacting electrical buses, insulation failures, loose connections, improper work procedures, impurities/dust buildup, corrosion, condensation, over-voltage conditions, or equipment malfunctions. Arcing faults produce hazards of extreme temperatures, light, sound, and pressure.

This document provides procedures to establish and maintain an Arc Flash Hazard Program (AFH Program) to be utilized by NYU Winthrop Hospital (NYUWH). The requirements of this document are applicable to all NYUWH facilities that contain energized electrical equipment. Within this document, this program is referred to as the AFH Program and is a major component of a complete electrical safety program.

The complete mitigation of arc flash hazards is not possible in all cases. The most effective method to mitigate an AFH is to de-energize electrical equipment prior to maintenance activities. Only trained, qualified, and properly equipped personnel should be near energized equipment. The calculations and recommendations of applicable standards and this document are intended to identify and reduce arc flash incident energy levels. These procedures do not guarantee complete protection from arc flash hazards, however compliance with these procedures will reduce the possibility of burns and other injuries. Personnel who work in our facilities must be adequately protected from the risk of exposure to electric energy. Work only on de-energized equipment, unless additional or increased hazards result from de-energizing equipment, or it is not possible to complete critical work due to equipment design or operational limitations; (Energized Electrical Work Permit shall be required.)

2. Purpose

This program has been established in order to:

- Ensure the safety of employees who may work on or near electrical equipment.
- Ensure that employees understand and comply with safety standards related to electrical work.
- Ensure that employees follow uniform practices during the progress of electrical work.
- Comply with NFPA 70E & OSHA Standards according to the following key points:
 - a. Provide and demonstrate a safety program with defined responsibilities.
 - b. Provide personal protective equipment (PPE) for workers.
 - c. Provide documented training to workers.
 - d. Provide appropriate tools for safe work.

3. Definitions

- **Approved** – Acceptable to the Authority Having Jurisdiction (AHJ).
- **Approved Equipment** – listed equipment being used in accordance with its listing or labeling for the manufacturer's intended purpose; or equipment that is approved by the AHJ as safe for its intended purpose.
- **Arc Flash Hazard**– A dangerous condition associated with the possible release of energy caused by an electric arc.
- **Arc Flash Hazard Analysis**– A study investigating a worker's potential exposure to arc flash energy, conducted for the purpose of injury prevention and to determine safe work practices, arc flash boundary, and the necessary types of personal protective equipment (PPE).
- **Arc Flash Suit**– A complete arc-rated clothing and equipment system covering the entire body, except for hands and feet.
- **Arc Flash Boundary**– When an arc flash hazard exists, the boundary is an approach limit at a distance from a prospective arc source within which a person could receive a second degree burn if an electrical arc flash were to occur.
- **Contractor** - A non-NYUWH employee being paid to perform work in our facility.
- **Electrical Hazard**– A dangerous condition such that contact or equipment failure can result in electric shock, arc flash burn, thermal burn, or blast.
- **Electrical Safety**– Recognizing hazards associated with the use of electrical energy and taking precautions so hazards do not cause injury or death.
- **Electrically Safe Work Condition**–An electrical conductor or circuit part has been disconnected from energized parts, locked/tagged in accordance with established standards, tested to ensure the absence of voltage, and grounded if determined necessary.
- **Incident Energy**– The amount of energy impressed on a surface, a certain distance from the source, generated during an electrical arc event. One of the units used to measure incident energy is calories per centimeter squared (cal/cm²).

- **Incident Energy Analysis**– Used to predict the incident energy of an arc flash for a specified set of conditions.
- **Shock Hazard**– A dangerous condition associated with possible release of energy caused by contact or approach to energized electrical conductors or circuit parts.

4. Responsibilities

Department Head and Supervisors are responsible for:

- overall support and involvement in the program,
- making safety and health a priority in hospital operations,
- providing adequate funding for programs, and
- leading by example regarding safety and health issues.
- Evaluate work being performed and determine compliance with this program.
- Provide or assist in the task of specific training for electrical work qualifications.
- Maintain training recordkeeping.
- Periodically review and update this written program.
- Evaluate the overall effectiveness of the electrical safety program on a periodic basis.
- Ensure that all electrical and arc flash PPE is properly inspected and maintained.

Electrical Maintenance Manager is responsible for:

- Promote electrical safety awareness to all employees.
- Ensure employees comply with ALL provisions of the electrical safety program.
- Ensure employees receive training appropriate to their assigned electrical tasks and maintain documentation of such training.
- Develop and maintain a listing of all qualified employees under their supervision.
- Ensure employees are provided with and use appropriate protective equipment.
- Notify the Safety Manager of potential hazards requiring assessments, or improvements to the program.

Employees are responsible for:

- Follow the work practices described in this document, including the use of appropriate protective equipment and tools.
- Attend all training required relative to this program.
- Immediately report any concerns related to electrical safety to supervision.
- Properly maintain and inspect all personal protective equipment prior to each use.
- Properly maintain and inspect all electrical safety equipment (insulated hand tools, arc-rated faceshields, etc.).

- Wear all required personal protective equipment – there are no exceptions.
- Inspect the equipment in accordance with manufacturer’s guidelines and instructions.
- Report hazardous conditions or other health and safety concerns immediately to their supervisors/foremen/project managers.
- Complete an Energized Electrical Work Permit prior to commencing any work.

Contractors/Outside Vendors: Any work for NYUWH at any NYUWH facility or off-site location must be conducted in accordance with all applicable regulations. Contractors must have a complete Energized Electrical Work Permit prior to commencing any work. All contractors must provide copies of their written program and employee training documentation. Contractors are also responsible to supply all needed equipment to perform any electrical work.

5. Training

Requirements

- Employees working on or near energized or potentially energized electrical circuitry shall be trained in energized electrical safe work practices and procedures, and designated as a qualified service technician after successfully completing the training program.

Qualified Service Technician

- Employees must receive training in avoiding the electrical hazards associated with working on or near exposed energized parts prior to performing energized electrical work. Such training will be provided when the employee is initially assigned to the job. This training will be either provided or coordinated by the Maintenance Trainer. Training will be provided annually, when hazards change, or when new technologies or new types of equipment are introduced to the Technicians

The following requirements are to be included in the training of qualified service technicians related to the service and operation of electrical equipment and installations:

- I. The Lockout/Tag out Training Program, including safe work practices required to safely de-energize electrical equipment.
- II. ARC Flash procedures.
 - a. Skills and techniques necessary to distinguish exposed live parts from other parts of electrical equipment.
 - b. Skills and techniques necessary to determine the nominal voltage of exposed live parts.

- c. Understanding approach distances and the corresponding voltages to which the qualified service technician will be exposed.
- d. Understanding the selection and use of proper work practices, personal protective equipment, tools, insulating and shielding materials, and equipment for working on or near energized parts.

6. Personal Protective Equipment (PPE)

General Requirements

- Employees working in areas where there are potential electrical hazards must use personal protective equipment (PPE) that is appropriate for the specific work to be performed. The electrical tools and protective equipment must be specifically approved, rated, and tested for the levels of voltage to which an employee may be exposed.
- NYUWH provides electrical protective equipment (e.g., Arc Flash Gear) required by this program. Such equipment shall include Arc Flash apparel, eye protection, head protection, hand protection, hearing protection and face shields where necessary.
- Employees shall wear nonconductive head protection whenever there is a danger of head injury from electric shock or burns due to contact with live parts, or from flying objects resulting from an electrical explosion.
- Employees shall wear protective equipment for the eyes whenever there is a danger of injury from electric arcs, flashes, or from flying objects resulting from an electrical explosion.
- Employees shall wear rated rubber insulating gloves where there is a danger of hand or arm contact with live parts or possible exposure to arc flash burn.
- Face shields must have arc rating for electrical work. Safety glasses or goggles must always be worn underneath face shields.
- Additional illumination may be needed when using tinted face shields as protection during electrical work.
- Electrical protective equipment must be selected to meet the criteria established by the American Society of Testing and Materials (ASTM).
- Insulating equipment made of materials other than rubber shall provide electrical and mechanical protection at least equal to that of rubber equipment.
- PPE must be maintained in a safe, reliable condition and be inspected for damage before each day's use, and immediately following any incident that can reasonably be suspected of having caused damage.
- PPE must be checked by the employee before being used. Any defect noticed shall result in the PPE not being used and the work assignment stopped.
- Employees must use insulated tools and handling equipment that are rated for the voltages to be encountered when working near exposed energized conductors or circuits.
- Any damaged PPE shall be immediately reported to supervisor for replacement.

- Any abuse or failure to use PPE will result in Progressive Discipline.
- Tools and handling equipment should be replaced if the insulating capability is decreased due to damage.
- Fuse handling equipment (insulated for circuit voltage) must be used to remove or install fuses.
- Ropes and hand lines used near exposed energized parts must be non-conductive.

7. Working on De-Energized Equipment

Electrically Safe Condition

The most important principle of electrical safety is to assume all electric circuits are energized unless each involved qualified service technician ensures they are not. Every circuit and conductor must be tested every time work is done on them. Proper PPE must be worn until the equipment is proven to be de-energized. Other PPE may be necessary depending on task:

- Voltage rated gloves and leather protectors must be worn.
- Electrically insulated shoes should be worn.
- Safety glasses must be worn.
- The required Arc Flash PPE must also be worn.

There are six steps to ensure conditions for electrically safe work:

- a. Identify all sources of power to the equipment. Check applicable up-to-date drawings, diagrams, and identification tags.
- b. Remove the load current, and then open the disconnecting devices for each power source.
- c. Where possible, visually verify that blades of disconnecting devices are fully open or that drawout type circuit breakers are fully withdrawn.
- d. Apply lockout/tag out devices in accordance with a formal, written policy.
- e. Test each phase conductor or circuit part with an adequately rated voltage detector to verify that the equipment is de-energized. Test each phase conductor or circuit part both phase-to-phase and phase-to-ground. Check the voltage detector before and after each test to be sure it is working.
- f. Properly ground all possible sources of induced voltage and stored electric energy (such as capacitors) before touching. If conductors or circuit parts that are being de-energized could contact other exposed conductors or circuit parts, apply ground-connecting devices rated for the available fault current.

The process of de-energizing is "live" work and can result in an arc flash due to equipment failure. When de-energizing, follow the procedures described in "Working On or Near Energized Equipment" (see below).

8. Lockout/Tagout Program

- Each employee shall be trained in Lockout/Tagout (LOTO) procedures by NYUWH.
- **Lockout/tagout application:** Each person who could be exposed to electric energy must be involved in the lockout/tagout process.
- Follow the posted lockout/tagout procedures:
 - a. Prepare & Notify
 - b. Shut-Down equipment
 - c. Isolate Hazardous Energy
 - d. Apply LOTO Devices
 - e. Control Stored Energy
 - f. Verify & Test
 - g. Begin LOTO work.
- A lock/lockout device with a tag that will be attached to a disconnecting device to prevent the re-energizing of the equipment being worked on without removal of the lock. The lockout device will have a "Danger Do Not Operate" tag with the employee name on the tag. That employee must be the only person who has the key for the lockout device they install, and that employee will be the only person to remove the lock after all work has been completed.
- A tagout device is a tag and a way to attach it that can withstand at least 50 pounds of force. Tagout devices should be used alone only when it is not possible to install a lockout device.
- The tag used in conjunction with a lockout or tagout device must have a label prohibiting unauthorized operation of the disconnecting means or unauthorized removal of the device. It will also be used as a means of identifying the lock holder.
- Electric lockout/tagout procedures should be posted at the machines location.
- **Individual qualified-employee control procedure:** For minor servicing, maintenance, inspection, and so on, on plug-connected equipment, work may be done without attaching lockout/tagout devices if the plug is next to where the employee is working, is always easy to see, and the equipment is never left alone while being serviced.
- **Return to service:** Once work is completed and lockout/tagout devices removed, tests and visual inspection must confirm that all tools, mechanical restraints, electric jumpers, shorts, and grounds have been removed. Only then is it safe to re-energize and return to service. Employees responsible for

operating the equipment and needed to safely re-energize it should be out of the danger zone before equipment is re-energized.

- **Temporary release:** If the job requiring lockout/tagout is interrupted for testing or positioning equipment, follow the same steps as in return to service (above).

9. Working on or Near Energized Equipment

Working on live circuits means actually touching energized parts, while working near live circuits means working close enough to energized parts to pose a risk even though work is done on de-energized parts. Common tasks where there may be a need to work on or near live circuits include:

- Taking voltage measurements.
- Opening and closing disconnects and breakers.
- Racking breakers on and off the bus.
- Removing panels and dead fronts.
- Opening electric equipment doors for inspection.

When opening and closing disconnects, use the left-hand rule when possible (stand to the right side of the equipment and operate the disconnect switch with the left hand).

Energized Electrical Work Permit

- If live parts are not placed in an electrically safe condition (de-energized), work to be performed shall be considered energized electrical work and shall be performed by written permit only. No one should ever work on energized equipment without a helper.
- Work related to testing, troubleshooting, and voltage measuring may be completed without a permit provided appropriate safe work practices and PPE are used.
- The permit must be originated by the qualified service technician.
- Energized Work Permits shall be submitted to the Director or designee.
- The permit must be posted in an appropriate location where the energized work is taking place for the duration of the task.

Approach Distances to Exposed Live Parts

The National Fire Protection Association (NFPA) defines three approach distances for shock hazards and one for arc flash.

- **The Limited Approach Boundary** - is the distance from an exposed live part within which a shock hazard exists.

- **The Restricted Approach Boundary** - is the closest distance to exposed live parts a qualified person can approach without proper PPE and tools. Inside this boundary, accidental movement can put a part of the body or conductive tools in contact with live parts or inside the prohibited approach boundary. To cross the Restricted Approach Boundary, the qualified person must:
 - a. Have an energized work permit that is approved by the supervisor or manager responsible for the safety plan.
 - b. Use PPE suitable for working near exposed live parts and rated for the voltage and energy level involved.
 - c. Be certain that no part of the body enters the prohibited space.
 - d. Minimize the risk from unintended movement by keeping as much of the body as possible out of the restricted space; body parts in the restricted space should be protected.

- **The Flash Protection Boundary** - is the approach limit at a distance from exposed live parts within which a person could receive a second degree burn if an electrical arc flash were to occur. To cross the Flash Protection Boundary, the qualified person must:
 - a. Use PPE appropriate for working near exposed live parts and rated for the voltage and energy level involved.
 - b. For systems of 600 volts and less, the flash protection boundary is 4 feet, based on an available bolted fault current of 50 kA and a clearing time of 6 cycles for the circuit breaker to act, or any combination of fault currents and clearing times not exceeding 300 kA cycles.
 - c. When working on de-energized parts and inside the flash protection boundary for nearby live exposed parts. If the parts cannot be de-energized, to protect against accidental contact wear proper PPE.

Other Precautions

- Employees shall not reach blindly into areas that might contain exposed live parts.
- Employees shall not enter spaces containing live parts unless illumination is provided that allows the work to be performed safely.
- Conductive articles of jewelry and clothing (including, but not limited to, watchbands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with

conductive thread, metal headgear, or metal frame glasses) shall not be worn where they present an electrical contact hazard with exposed live parts.

- Conductive materials, tools, and equipment that are in contact with any part of an employee's body shall be handled in a manner that prevents accidental contact with live parts. Such materials and equipment include, but are not limited to long conductive objects such as ducts, pipes, tubes, conductive hose and rope, metal-lined rules and scales, steel tapes, pulling lines, metal scaffold parts, structural members, and chains.

10. Energized Electrical Equipment Safety Program

Equipment Labeling

Switchboards, panel boards, industrial control panels, and motor control centers must be labeled to warn Technicians of potential electric arc flash hazards.

- The term Industrial Control Panel covers every enclosure that may contain exposed energized conductors or components.
- Marking (labeling) is intended to reduce the occurrence of serious injury or death due to arcing faults to Technicians working on or near energized electrical equipment.
- Markings (labels) shall be located so they are visible to personnel before examination, adjustment, servicing, or maintenance of the equipment.

11. Personal Protective Clothing Ratings

Building an electrical safety PPE list for workers begins with selecting the right clothing. Flame-retardant clothing is assigned an Arc Thermal Protective Value (ATPV) rating by the manufacturer. The ATPV value represents the amount of incident energy that would cause the onset of second-degree burns. It also signifies the amount of protection the clothing provides when an electrical arc comes in contact with the fabric.

Protective Clothing and Personal Protective Equipment Table NFPA 70E 130.7(C)(16) (2015 Edition)

Hazard/Risk Category*: 1

Clothing Description: Arc-rated clothing (see note 1)

Minimum ATPV Rating Cal/cm²: 4

Required Garments:

Shirt (long sleeve) and pants (long) or coverall; Flash suit hood or faceshield (see note 2); Jacket, parka, rainwear, or hardhat liner (AN)

Required Protective Equipment:

Hard hat; Safety glasses or goggles (SR); Hearing protection (ear canal inserts); Heavy-duty leather gloves (see note 3); Leather footwear (AN)

Hazard/Risk Category*: 2

Clothing Description: Arc-rated clothing (see note 1)

Minimum ATPV Rating Cal/cm²: 8

Required Garments:

Shirt (long sleeve) and pants (long) or coverall; Flash suit hood or faceshield (see note 2) and balaclava; Jacket, parka, rainwear, or hardhat liner (AN)

Required Protective Equipment:

Hard hat; Safety glasses or goggles (SR); Hearing protection (ear canal inserts); Heavy-duty leather gloves (see note 3); Leather footwear

Hazard/Risk Category*: 3

Clothing Description: Arc-rated clothing system (see note 1)

Minimum ATPV Rating Cal/cm²: 25

Required Garments:

Shirt (long sleeve) (AR); Pants (long) (AR); Coverall (AR); Flash suit jacket (AR); Flash suit pants (AR); Flash suit hood; Gloves (see note 1); Jacket, parka, rainwear, or hard hat liner (AN)

Required Protective Equipment:

Hard hat; Safety glasses or safety goggles (SR); Hearing protection (ear canal inserts); Leather footwear

Hazard/Risk Category*: 4

Clothing Description: Arc-rated clothing system (see note 3)

Minimum ATPV Rating Cal/cm²: 40

Required Garments:

Shirt (long sleeve) (AR); Pants (long) (AR); Coverall (AR); Flash suit jacket (AR); Flash suit pants (AR); Flash suit hood; Gloves (see note 1); Jacket, parka, rainwear, or hard hat liner (AN)

Required Protective Equipment:

Hard hat; Safety glasses or safety goggles (SR); Hearing protection (ear canal inserts); Leather footwear

AN = as needed (optional)

AR = as required

SR = selection required

*One of the two basic methods is used to determine a HRC for a job task

Notes:

(1) Arc rating is defined in NFPA 70E article 100. (2) Face shields are to have wrap-around guarding to protect not only the face but also the forehead, ears and neck, or, alternatively, an arc-rated arc flash suit hood is required to be worn. (3) If rubber insulating gloves with leather protectors are used, additional leather or arc-rated gloves are not required. The combination of rubber insulating gloves with leather protectors satisfies the arc flash protection requirement.

NYU Winthrop Hospital
Energized Electrical Work Permit

Part I: To be completed by the requester:

Job/work order number _____

1) Description of circuit/equipment/job location:

2) Description of work to be done:

3) Justification of why the circuit/equipment cannot be de-energized or the work deferred until the next scheduled outage:

Part II: To be completed by the Electrically qualified persons doing the work:

Check when completed

1) Detailed job description procedure to be used in performing the above detailed _____

2) Description of the safe work practices to be employed _____

3) Results of the arc flash risk assessment

a) Voltage to which personnel will be exposed _____V

b) Limited approach boundary

c) Restricted approach boundary

d) Necessary shock, personal ,and other protective equipment to safely perform assigned task

4) Results of the arc flash risk assessment:

a) Available incident energy at the working distance or arc flash PPE category

- b) Necessary arc flash personal and other protective equipment to safely perform the assigned task
 - c) Arc flash boundary
 - 5) Means employed to restrict the access of unqualified persons from the work area:
 - 6) Evidence of completion of a job briefing including discussion of any job related hazards:
 - 7) Do you agree the above described work can be done safely? Yes No
- (if no, return to requester)

Electrically Qualified Person(s)

Date

Electrically Qualified Person(s)

Date

Part III: Approval(s) to perform the work while electrically energized:

Director of Engineering

Electrical Manager

Electrical Foreman

ENGINEERING DEPARTMENT POLICY

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1. Introduction

NYU Winthrop Hospital (NYUWH) Asbestos awareness was established to meet the requirements of the Occupational Safety and Health Administration (OSHA) General Industry Standard (29 CFR 1910.1001) and Construction Industry Standard (29 CFR 1926.1101) and the United States Environmental Protection Agency Asbestos Hazard Emergency Response Act (US EPA AHERA)

NYUWH is dedicated to providing a safe and healthful work environment for its employees, patients and visitors. In recognition of the potential health impacts associated with asbestos, NYUWH is committed to a comprehensive asbestos control program. This program is implemented and maintained through the Engineering Department and is responsible for establishing asbestos abatement procedures, asbestos inspection, air-monitoring, renovation, and demolition activities within all NYUWH properties.

The Asbestos awareness & procedures were developed to ensure the following:

1. Patients, staff, visitors, vendors and all others at NYUWH are not exposed to asbestos fibers.
2. Asbestos waste is handled and disposed of properly.
3. Compliance with all applicable Federal, State and Local Asbestos Regulations.

2. Purpose

The control of safety and health hazards at NYUWH is primarily through the implementation of safety & engineering, work practice and administrative controls. Personal Protective Equipment (PPE) is used to supplement these controls or whenever the controls are not feasible or are in the process of being implemented. PPE is also recommended whenever exposures to chemical, physical or biological agents can be prevented or reduced by its use.

This written program establishes the procedures and requirements necessary to meet established standards and federal regulations for occupational exposure to asbestos

fibers, to meet the requirements of OSHA compliance which encompasses the disturbance and/or abatement of asbestos containing building materials, and to provide the necessary health and safety protection to NYUWH staff, patients and visitors.

Asbestos (ACM) procedure

The Asbestos procedure is administered by the Engineering Department to provide exposure monitoring services, building inspection/surveys (bulk sampling) for the identification of asbestos containing materials, asbestos project design services, asbestos abatement project and air monitoring services, emergency response to fiber release episodes, education/information, medical monitoring, and training for NYUWH personnel.

Responsibilities

The Director of Engineering is responsible for:

- Assuring the health and safety of employees, patients and visitors at NYUWH
- Being kept informed of all areas under his or her jurisdiction where potential asbestos exposures exist and initiating protection programs that adhere to the Asbestos policy & procedure requirements of this manual.
- Ensuring the posting of warning labels/signage and Asbestos Inspection Reports where required.

Supervisor or Project Manager (Capital, Maintenance and Facilities)

Each person who is in charge of a project, maintenance/repair, renovation/demolition, or other activity from Capital, Maintenance, and/or Facilities where asbestos containing materials may be present is responsible for:

- Identifying, asbestos-containing building materials prior to any disturbance of these materials. Various Federal (OSHA and EPA) require Asbestos Inspections prior to renovation/demolition activities. This shall be accomplished by following the Asbestos policy
- Ensuring that the requirements of the Asbestos policy & procedure are followed by all personnel, trades, and contractors who are involved with the project.
- Reviewing of the required Asbestos Inspections prior to activities that may disturb any Asbestos Containing Materials
- Performing all project related duties as outlined in the Project Manager Responsibilities

Performance:

ACM shall only be removed or otherwise impacted by a licensed asbestos abatement contractor utilizing licensed workers. ACM or other asbestos-contaminated debris/waste shall be properly labeled and transported off-site by a licensed waste hauler to a registered landfill where proper manifesting procedures shall be utilized.

All asbestos-related activities will be managed and/or coordinated through the Engineering Department at all owned property.

Practices include but are not limited to:

Determine the presence and location of ACM.

Coordinate, oversee and manage all asbestos projects impacting ACM in NYUWH facilities including renovation and demolition.

Manage all asbestos abatement activities.

Procure the services of licensed asbestos abatement contractors and consultants.

Conduct training to inform, provide knowledge and basic awareness on asbestos issues.

Manage the campus-wide and offsite database including survey and abatement with the associated documentation.

Any NYUWH department or contractor that will be performing work with the potential to disturb suspect asbestos-containing materials in NYUWH-owned property shall coordinate work through Engineering.

Engineering shall be provided with the scope of work, including drawings with demolition notes when available, along with the schedule of the project. All information must be submitted in a timely manner for coordination and regulatory notification purposes.

During any project in NYUWH-owned property that will involve the disturbance of asbestos-containing materials, the project manager will arrange a meeting with Engineering to review the scope of the project and submit in writing detailed information including the scope of work.

ENGINEERING DEPARTMENT POLICY

	No:	ENG-01 (C)
SUBJECT:	Confined Space Policy	
EFFECTIVE:	MARCH 1, 2016	REVISED: N/A
SUPERSEDES:	N/A	PAGES: 14
CROSS REFERENCE:	OSHA regulations, 29 CFR 1910.146	
APPROVED BY:	JOSEPH BURKE, VP ENGINEERING	

1. Introduction

According to the U.S. Department of Labor, Occupational Safety and Health Administration's (OSHA) regulations, 29 CFR 1910.146, "Permit-Required Confined Spaces", a confined space is defined as any location that is large enough and so configured that an employee can bodily enter, has limited openings for entry and egress, and is not intended for continuous employee occupancy. Confined spaces may have atmospheric conditions and/or physical hazards present and include: manholes, stacks, pipes, storage tanks, trailers, tank cars, pits, sumps, see, storm water bas, vaults, hoppers, and bins. In addition, limited access to these locations complicates the retrieval of anyone incapacitated.

2. Purpose

NYU Winthrop Hospital (NYUWH) will take every reasonable precaution to provide a work environment free from recognized hazards for its employees.

The confined space written program outlines the practices and procedures to protect NYUWH employees and contractors/vendors from hazards associated with permit required confined space entry. For confined space locations containing atmospheric or physical hazards that would impede self rescue, the permit-required confined space procedures will apply. The provisions of this program require NYUWH to provide the means, procedures, training and equipment to mitigate hazard and verify compliance through the use of a written permit. The confined space program will be available to all employees and their representatives for review. Prior to entry of a permit-required confined space, an entry team consisting of at least one designated entrant, attendant and entry supervisor shall be established.

Atmospheric testing is required before entering any permit-required space. If a hazardous atmosphere is present, employees shall not enter the space until ventilation procedures have been carried out and testing reveals acceptable entry conditions based upon the NYS Department of Labor Public Employee Safety and Health Bureau's (PESH's) permissible exposure limits (PEL). Whenever possible, all atmospheric hazards will be completely eliminated before entry.

Prior to entry of a permit-required confined space, an entry team consisting of at least one designated entrant, attendant and entry supervisor shall be established.

Atmospheric testing is required before entering any permit-required space. If a hazardous atmosphere is present, employees shall not enter the space until ventilation

procedures have been carried out and testing reveals acceptable entry conditions based upon the NYS Department of Labor Public Employee Safety and Health Bureau's (PESH's) permissible exposure limits (PEL). Whenever possible, all atmospheric hazards will be completely eliminated before entry.

NYUWH will provide all equipment required for entry in accordance with 29 CFR 1910.146 and will ensure that all affected employees are trained and use the equipment properly. All required equipment will be maintained according to the manufacturer's recommendations by the Director of Engineering or his designee.

Effective communication procedures will be established between the entry team and to the rescue service prior to entry. All communication devices will be provided and maintained by Engineering. Training will be provided to any employee before they are assigned any duties related to permit-required confined space entry.

All contractors who will be entering permit-required confined spaces within NYUWH will submit for approval their confined space entry program, employee training documentation, and agreement with their designated rescue service along with their bid and will be required to adhere to the requirements of 29 CFR 1910.146.

3. Definitions

Acceptable Entry Conditions: Conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit required confined space entry can safely enter, and work within the space.

Affected Employee: Any employee that performs any work related to confined space entry.

Attendant: An individual stationed outside one or more permit spaces who monitors the authorized entrant(s) and who performs all attendant duties assigned in our program.

Authorized Entrant: An individual who is trained and authorized by NYUWH to enter permit required spaces.

Blanking or Blinding: The absolute closure of a pipe, line or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line or duct with no leakage beyond the plate.

Confined Space: A space that:

Is large enough and so configured that an employee can bodily enter and perform assigned work; and

Has limited or restricted means of entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, sewers, storm water basins and pits and spaces that may have limited means of entry); and

Is not designed for continuous human occupancy

Contractor: A non-NYUWH employee being paid to perform work in our facility.

Entry: The act by which a person intentionally passes through an opening into a permit required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Entry Permit: The written or printed document that is provided by the facility to allow and control entry into a permit space and that contains information specified in the confined space program.

Entry Supervisor: The person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required. The entry supervisor can also serve as an attendant.

Hazardous Atmosphere: An atmosphere that may expose employees to the risk of death, incapacitation, impairment of abilities to self rescue (escape unaided from a permit space), injury, or acute illness from one or more of the following:

1. Flammable gas, vapor, or mist in excess of 10% of the Lower Flammable Level (LFL)
2. Airborne combustible dust at a concentration that meets or exceeds its LFL (Can be approximated where the dust obscures vision at a distance of 5 feet or less)
3. Atmospheric oxygen concentration below 19.5% or above 23.5%
4. Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in 29 CFR 1910 Subpart G, Occupational Health and Environmental Control or in Subpart Z, Toxic and Hazardous Substances.
5. Any other atmospheric condition that is Immediately Dangerous to Life or Health (IDLH)

Isolation: The process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as blanking or blinding, misaligning or removing sections of lines, pipes, or ducts, lock out or tag out of all sources of energy or mechanical linkages.

Non-Permit Confined Space: A space that does not contain or have the potential to contain any hazard capable of causing death or serious physical harm.

Permit Required Confined Space: A confined space that has one or more of the following characteristics:

1. Contains or has the potential to contain a hazardous atmosphere;
2. Contains a material that has the potential for engulfing an entrant;
3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section; or
4. Contains any other recognized serious safety or health hazard

Rescue Service: The personnel designated to rescue employees from confined spaces.

Retrieval System: Equipment used for non-entry rescue of persons from a confined space.

Testing: The process by which the atmospheric hazards that may confront entrants of a space are identified and evaluated. Testing includes specifying the tests that are to be performed in the space.

Vendor/Contractor: A non-NYUWH employee being paid to perform a service in our facility.

**NYUWH-PERMIT REQUIRED CONFINED SPACE PROGRAM
NYUWH-CONFINED SPACE PROGRAM**

4. Responsibilities

NYUWH: is responsible for development and maintaining the confined space program. A master list of both permit and non-permit confined spaces shall be established and updated as necessary. NYUWH is responsible for providing a confined space training program for entrants, attendants and entry supervisors which will enable employees to recognize potential hazards and take the appropriate actions to control those hazards. This training will be offered to all employees who have the potential to work in confined spaces. The confined space program shall be reviewed and updated annually.

Department Heads and Supervisors: are responsible for reviewing the locations within their respective areas to identify either known or suspect confined space locations. Each department head must ensure that appropriate personnel receive and maintain required confined space training.

Employees: All NYUWH employees shall comply with all procedures outlined in this policy.

All employees must complete training as required by their supervisors and follow the procedures as outlined in this program when entering a confined space. They should also assist in identifying potential confined space locations and hazards.

Contractors/Outside Vendors: Any work for NYUWH at any NYUWH facility or off-site location must be conducted in accordance with all applicable regulations. Contractors must have a written confined space program that complies with all applicable regulations. All contractors must provide copies of their written program and employee training documentation along with their rescue agreement to the contracting department. Contractors are also responsible to supply all needed equipment to perform safe entry and/or rescue. When a contractor is required to enter or work in a permit required space, the contracting department will furnish a written copy of the known hazards identified in that space to the contractor.

7. Space Evaluation and Classification

All spaces in question will be properly evaluated to determine the specific confined space classification. A list will be generated, reviewed and updated whenever there are changes affecting work conditions or when a new confined space is identified. If a new space is identified it will be considered a permit-required confined space until proven otherwise. If conditions change in a space causing the need for a reclassification, a supervisor overseeing the project must be notified must assess the space. If a permit-required space can be declassified to a confined space due to the elimination of all hazards, it must be documented and changed in the inventory. If conditions change and a confined space becomes permit-required, all hazards must be documented and added to the inventory.

8. Non-Permit Required CONFINED SPACES

Entry into non-permit required confined spaces is not regulated. Employees are always required to evaluate the potential hazards of all jobs prior to beginning work. If any questions or concerns arise during the evaluation the employee should discuss the issue with their supervisor or department head.

9. Prevention of Unauthorized Entry

Unauthorized entry into permit spaces shall be prevented. Prevention measures include training, signs, and security measures, all employees in or around confined spaces shall attend confined space awareness training.

10. Permit System

The permit process guides the entry team through a systematic evaluation of the space to be entered.

The permit should be used to establish and document appropriate entry conditions. A confined space entry permit must be completed before approval can be given to enter a permit-required confined space. All members of the entry team are entitled to review the permit. A permit shall be kept at the job site for the duration of the job. Permits are only good for the specified duration, or an eight hour shift. Permits may not exceed the time required to complete a task. Once completed the entry supervisor must sign the permit to authorize entry. If a supervisor must be relieved of their duties, the permit shall be cancelled and a new permit must be filled out by new entry supervisor. All entrants must exit the space and conditions must be reassessed. If circumstances cause an interruption in the work or a change in the alarm conditions for which entry was approved, a new confined space entry permit must be completed. Permits must be kept for at least one year and will be kept on file in Engineering. If hazardous conditions are found at a space or an incident has occurred a copy of the entry permit will be attached to the inventory documentation so that future entrants are aware of the hazards that they may encounter. The entry supervisor shall terminate the permit when the operations are complete or if a condition arises that constitutes Any such condition shall be documented on the permit.

11. Duties of the Entry Team

Entry teams must be established prior to entry and consist of at least one attendant, one entrant and must have an entry supervisor.

A. Entry Supervisor

The entry supervisor will:

1. Know and understand the hazards that may be faced during entry, including information on the signs or symptoms, and consequences of the exposure.
2. Verify, by checking that the appropriate notations have been made on the permit; that all tests specified by the permit have been conducted; and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.
3. Terminate the entry and cancel the permit when reasons for entering the space have been completed or when an unacceptable condition within the space or outside the space is detected.
4. Verify that rescue services are available and that the means of calling the rescue service is operable. The entry supervisor will ensure that the attendant knows the method for summoning help if rescue is required.
5. Enforce this policy to ensure safe entry into any space identified as a permit-required confined space.

6. Determine that throughout the entry process, all responsibilities and functions remain consistent with safety, regardless of production requirements, time or cost.
7. Have the authority to stop work if they feel that the entry is unsafe for any reason.
8. Be trained to the proper level of responsibility.

If an Entry Supervisor must be relieved at any point during the entry, the permit must be cancelled by said entry supervisor. All entrants must evacuate the space and the new Entry Supervisor must assess the space and conditions with the entry team and a new permit.

B. Entrant

All entrants will know the following:

1. Verify that rescue services are available and that the means of calling the rescue service is operable.
2. Hazards that may be faced during entry, including information on the mode, signs, or symptoms, and consequences of the exposure.
3. Proper use of equipment.
4. Means and methods of communication with the attendant.
5. Warning signs or symptoms of exposure to a dangerous situation, or the entrant detects a condition that would warrant immediate evacuation.
6. When self-rescue must occur by means of an order by the attendant or entry supervisor, when signs or symptoms of exposure are detected, or when any prohibited condition is recognized.

All entrants must be qualified for the task assigned, (electrical, welding etc.)

C. Attendant

All attendants will:

1. Know the hazards that may be faced during entry or while in the space, including information on the mode, signs or symptoms, and consequences of the exposure to suspected hazards.
2. Be aware of possible behavioral effects of hazard exposure in authorized entrants.
3. Continuously maintain an accurate count of authorized entrants in the permit space and ensure that the means used to identify authorized entrants is precise at all times.
4. Remain outside the permit space during entry operations until relieved by another authorized attendant(s).
5. Communicate with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space when conditions warrant an immediate evacuation.
6. Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions:
 - a. If the attendant detects a hazardous condition.
 - b. If the attendant detects a change in the behavior of any authorized entrant which would suggest an exposure to a hazard.
 - c. If the attendant detects a situation outside the space that could endanger the authorized entrants.

- d. If the attendant cannot effectively and safely perform all the duties required as outlined in this policy.
7. Summon rescue and other emergency services as the attendant determines that authorized entrants may need assistance to escape from permit space hazards.
8. Do the following when unauthorized person(s) approach or enter a permit space while entry is underway:
 - a. Warn the unauthorized person(s) that they must stay away from the permit space.
 - b. Advise the unauthorized persons they must exit immediately if they have entered the permit space.
 - c. Inform the authorized entrants and the entry supervisor, if unauthorized person have entered the permit space.
9. Perform non-entry rescue (rescue attempts that do not cause the attendant to break the plane of the entry to the space).

12. Permit Required CONFINED SPACE ENTRY

A. PREPARATION OF THE SPACE

1. An entry supervisor, attendant (s) and entrant (s) will be assigned. All personnel involved with the entry and their representative, can observe all aspects of the preparation.
2. The entry supervisor will brief the entrant(s) and attendant(s) on all aspects of the job.
3. At any time, the entry supervisor, the entrant and/or the attendant can either postpone or stop the entry due to a safety concern.
4. The entry team will be provided and will wear all appropriate personal protective equipment based upon the hazards present.
5. If the space is located on a roadway and will compromise traffic in any way, a temporary traffic control plan must be created and set up in accordance with the rules and regulations of the Manual of Uniform Traffic Control Devices (MUTCD).
6. A new permit will be opened and previous hazards encountered in the space will be reviewed from prior permits.
7. The air monitor shall be appropriately calibrated according to manufacturer's requirements and a bump test will occur prior to any entry. Battery life will be checked and must be at full capacity. Air Monitoring around the space is required prior to opening the space and must be documented on the permit.
8. Any conditions making it unsafe to remove an entrance cover shall be eliminated before the cover is removed.
9. Prior to opening the space, any entrances that will be open must be appropriately blocked to prevent accidental entry.
10. Upon opening the space, the oxygen content, flammable gases and vapors, and potential toxic air contaminants will be monitored and documented on permit using the provided gas monitors and be documented for every five feet of the space without breaking the plane.
11. If a hazardous atmosphere exists, continuous forced air ventilation is required throughout the duration of the entry. Entrants may not enter the space until acceptable entry conditions are confirmed. If acceptable entry conditions cannot be established and maintained, entry shall not be allowed.
12. Acceptable entry conditions are as follows:

Oxygen content: $\geq 19.5\%$ and $\leq 23.5\%$

Flammables: $\leq 10\%$ of the LEL

All toxic air contaminants must be less than the Public Employees Safety and Health Bureau's (PESH) permissible exposure limit. Hydrogen sulfide must be less than 10 parts per million and carbon monoxide must be less than 35 parts per million.

13. All connecting lines, ducts and pipes connected to chemical, gas and utility sources will be broken and capped or blanked.

14. Heating devices (e.g. jackets, coils, mantels, etc.) will be rendered safe either through line breaking/blanking or electrical lockout/tagout.

15. All mechanical, hydraulic and electrical hazards (e.g. agitators, machine drives, electrical lines, etc.) will be controlled through lockout/tagout.

16. If water or sewage has collected in the space it shall be pumped out prior to entry if possible.

If the source is a continuous flow, a pump will be required to continuously remove water or sewage and be watched closely by the entry supervisor or an attendant to be sure the pump is working properly throughout the duration of the entry.

17. The space will be rinsed and/or dried if there is a build-up of hazardous or slippery material on the walls of the space.

18. The space will be cooled down to 110 degrees Fahrenheit or less.

19. Safe access to the space will be provided.

20. Adequate lighting will be provided either through low voltage lighting or through 110 Volt plugged into a Ground Fault Circuit Interrupter (GFCI).

21. All tools and communication devices shall be checked to make sure that they are intrinsically safe if the potential exists for a flammable atmosphere.

22. Communication methods shall be established prior to entry between the entrant and attendant and will be selected based on the size, location and characteristics of the space. If the selected device has batteries, the batteries must be fully charged.

23. The rescue service shall be notified prior to any entry. They must be informed of the time, location and hazards present.

24. All retrieval equipment must be inspected prior to entry. If there is a problem with any piece of equipment a supervisor must be notified and the equipment must be taken out of service.

25. For vertical entries the retrieval system will be set-up at the entry point and will include a tripod, winch with fall protection, and a full body harness. Each authorized entrant shall use a chest or full body harness, with a retrieval line attached at the center of the entrant's back near shoulder level, above the entrant's head, or at another point which the employer can establish presents a profile small enough for the successful removal of the entrant.

26. If an entrant must unhook from the retrieval system for safety purposes, no hazardous atmosphere may exist and the rescue team must be on site.

27. If any other items such as tools need to be lowered into a space, a separate winch will be attached to the tripod and used for such purposes.

28. For horizontal entries or spaces where a tripod system cannot be used, wristlets may be used in lieu of the chest or full body harness if the employer can demonstrate that the use of a chest or full body harness is infeasible or creates a greater hazard and

that the use of wristlets is the safest and most effective alternative.

B. Permit Collection

1. The permit will be completed by the entry supervisor (See Appendix B)
2. All information requested on the permit will be completed by the entry supervisor or NA (not applicable) will be written in.
3. The time of permit issuance will always be written in. In no case will a permit remain valid for more than 8 hours. If the job runs past 8 hours, a new permit will be issued.
4. Expired permits will be returned to the program administrator.

C. Entry

1. All required equipment for entry including: communication, lighting, access, safety and rescue as well as the tools needed to accomplish the job will be available at the entrance.
2. Continuous space atmosphere monitoring will be established either by the attendant or by the entrant and will be documented every 15-30 minutes.
3. The attendant will stay in the immediate area of the entrance to the space and will stay in contact with the entrant.
4. The entry supervisor will formally approve the entry to begin. At any time during the job the entry supervisor, entrant or the attendant can cancel the permit and cause the entry to be either postponed or stopped due to safety concerns.
5. The attendant will document meter readings at intervals decided upon by the entry supervisor, but not longer than one hour.
6. The attendant will immediately communicate any exterior condition to the entrant that could affect her/his safety (e.g. fire alarm, severe weather, etc.)

D. Entry Completion

1. The entry permit will be closed out by listing the time of space exit and any other pertinent information.
2. The Rescue Service will be notified that the entry is complete.
3. The entry closure will be replaced.
4. Blanked and capped piping, tubing, ducts etc. will be re-attached.
5. Disconnected hydraulic, mechanical and/or electrical equipment will be reattached.
6. Lockout/tag outs will be released.
7. Operating personnel for the space will be notified that it can be returned to production (if applicable).
8. All safety and entry equipment will be cleaned, inspected and returned to storage locations.
9. The cancelled permit will be returned to the program administrator.

E. Alternate Entry Procedures

Under certain circumstances employers may use alternate entry procedures in place of full permit entry process. Alternate entry procedures can be considered for permit spaces that **only** have an actual or potential atmospheric hazard and **no other** serious hazards. To use these alternate procedures, employers must be able to provide data and other verification to support that the only potential hazard is atmospheric and that

continuous forced air ventilation alone can maintain a safe atmosphere throughout the entry. Workers still must be trained, the space still must be monitored, and ventilation must be continuous.

Conditions for Use

An employer may use alternate procedures for entering a permit space under the following conditions:

1. Ventilation alone will maintain safe conditions.
2. Monitoring and inspection must be performed to ensure that conditions are safe.
3. If initial entry must be made in order to perform this inspection, it must be done under permit procedures.
4. The only hazard is an actual or potential hazardous atmosphere.
5. Certification with the date, location of the space and signature must be made available to entry personnel.

13. Rescue Service

Employer name has made arrangements with: Mineola FD to provide entry rescue service. This service's ability to respond to a rescue summons in a timely manner, considering the hazard(s) identified has been evaluated and an agreement of services has been completed. The designated rescue service has been provided a copy of the inventory and a copy of all applicable MSDS for each space. The designated rescue service shall also be provided prior access to all spaces so that the rescue service can develop and practice rescue operations.

The rescue service will be contacted by a specific means of communication identified. Upon arrival the rescue team will be furnished with the permit and informed of any hazards present.

Regardless of the number of permit required confined space entries made, the Rescue Service will be contacted at least annually to review the following information.

1. List of permit-required confined spaces.
2. The hazards of the spaces.
3. Procedures for entry.
4. Equipment available on site.
5. Training programs.

15. Contractors / Vendors

Any work for NYUWH at any NYUWH facility or off-site location must be conducted in accordance with all applicable regulations. Contractors must have a written confined space program that complies with all applicable regulations. All contractors must provide copies of their written program and employee training documentation along with their rescue agreement to the contracting department. Contractors are also responsible to supply all needed equipment to perform safe entry and/or rescue. When a contractor is required to enter or work in a permit required space, the contracting department will furnish a written copy of the known hazards identified in that space to the contractor. Any contractor/vendors who will be engaged in a permit required confined space entry must, at a minimum, follow this procedure. Whenever a contractor will be involved in a permit-required confined space entry, a written plan for the entry will be submitted to the

program administrator prior to the work being scheduled. The program administrator or a designated employee, who has been trained as an entry supervisor, will approve the contractor written plans. Prior to entry the administrator must inform the contractor if any hazards previously confronted in the space, apprise the contractor of any precautions or procedures that have been implemented for the protection of employees working near that space and coordinate any operations between the contractor and NYUWH.

16. Training

Training will be provided for all personnel who are attendants, entrants or entry supervisors as follows:

Before the employee is assigned duties relating to permit required confined space entry;

Before the employee's assigned duties change;

Whenever there is a change in operations that presents a hazard that the employee has not been trained in previously;

Whenever there is an indication that the procedure is not being followed safely and/or when there are indications that employee practices or knowledge do not meet the requirements.

Training shall establish proficiency in the duties required by the standard. All training will be certified in writing with the employee's name and the date of training in addition to an outline of material presented.

Annual refresher training shall be provided to all affected employees and will include a non-entry rescue practice drill.

All employees that work near confined spaces and are not allowed to enter, will be given a confined space awareness training in order to comply with part 29 CFR 1910.146(c)(2).

Training records will be kept and maintained by Engineering.

NYU Winthrop Hospital Engineering Department

CONFINED SPACE ENTRY PERMIT

Note: This permit is valid for up to 8 hours

Issued: Date ___/___/20___ Time: _____ AM / PM
Expiration: Date ___/___/20___ Time: _____ AM / PM

Type of Confined Space: _____
Location: _____

Reason for Entry: _____

Work to be Performed: _____

Identified/Known Hazards	If Not Applicable, Indicate " N/A "	Means of Elimination / Control of Hazard
Engulfment		
Electrical		
Mechanical		
Extreme temperatures		
Biological		
Suffocation		
Crushing hazards		
Falling objects		
Water		
Burn		
Hazardous materials		
Atmospheric (see chart on pg 3)		
Other: Specify -		

Rescue Plan / Procedures:

Rescue Team / Service: _____ Phone/Contact #: _____

_____ Phone/Contact #: _____

Atmospheric Monitoring / Periodic Tests:

	Permissible Level	Level at Entry / Time:	Time						
Oxygen	19.5 to 23.5%								
Combustible gas	<10%								
Carbon Monoxide	35 ppm								
Hydrogen Sulfide	10 ppm								
Sulfur Dioxide	2 ppm								
Other: Specify									

Tester: _____ Signature: _____

The undersigned have reviewed work authorized by this permit. Written and verbal instructions and safety procedures have been received and are understood. Entry cannot be approved and this permit is not valid unless all appropriate items and signatures are completed.

Entry Supervisor: _____ Department: _____ Signature: _____

If role of Entry Supervisor is handed over to another qualified Entry Supervisor, indicate:

Entry Supervisor: _____ Department: _____ Signature: _____

Authorized Entrant: _____ Dept/ Company: _____ Signature: _____

Authorized Entrant: _____ Dept / Company: _____ Signature: _____

Attendant: _____ Department: _____ Signature: _____

Attendant: _____ Department: _____ Signature: _____

This permit is to be kept at job site during entry / operations

Problem(s) encountered during entry operations? ___ No ___ Yes / Indicate issue(s) and actions taken:

ENGINEERING DEPARTMENT POLICY

	No:	ENG-01 (D)
SUBJECT:	Safety Procedures for Construction	
EFFECTIVE:	MARCH 1, 2016	REVISED: N/A
SUPERSEDES:	N/A	PAGES: 7
CROSS REFERENCE:	OSHA regulations, 29 CFR 1926.1101	
APPROVED BY:	JOSEPH BURKE, VP ENGINEERING	

1. Planning – Preconstruction / Pre-Project Risk Assessment

When planning demolition, construction, renovation, or maintenance projects, the organization will conduct a proactive risk assessment utilizing risk criteria to identify hazards that could compromise the facility and/or patient care. The scope and location of the planned projects and the areas impacted will determine the risk, and the need for interim life safety measures will be assessed. Risk reduction strategies will be employed in conjunction with the assessment to address all identified risks and mitigate potential hazards. Risk criteria will address the impact work has on various factors such as air quality, infection control, noise, vibration, odors, dust, water, egress, emergency procedures, utility systems / requirements, and security measures, particularly in designated security-sensitive areas. A Pre-Construction Risk Assessment (PCRA/ICRA) will be completed and the need for Interim Life Safety (ILSM) assessed and documented on the ILSM matrix. Applicable ILSM will be implemented as warranted, monitored, and modified if necessary throughout the project.

A High Risk Construction Activity Review (HRCAR) form will be completed for identified high risk construction-related activities including, but not limited to: confined space work (requires confined space work plan), crane operations (requires site drawings showing crane and material placement, swing of boom, areas to be vacated below, and coordinated with site utilities), excavation/trenching/form work (requires approved engineered drawings), scaffolding (requires approved engineered construction documents), shoring (requires approved engineered drawings), utility shutdown (requires lock out/tag out plan). Examples of other such activities include: asbestos abatement, demolition, equipment operations, elevator construction, excavation/foundations, fall exposure, hoist construction, hot work, masonry construction, sidewalk bridge construction, superstructure concrete, superstructure steel, working at heights greater than six feet, utility shutdowns. A Pre-Task Plan / Job Hazard Analysis will be completed for each high risk construction activity that will help identify hazards before they occur and outline tasks necessary to complete the activity involving activities. The standardized NYU Winthrop Hospital (NYUWH) Pre-Construction Risk Assessment tool will be utilized to carry out this program.

2. Notification of Construction/Alteration

Prior to undertaking any construction/alteration projects (in-house or contracted work), the following hospital personnel shall be notified and apprised of the extent of the project: Administration; Infectious Disease; Hospital Safety Office/Designee; and Security as

applicable. Notification will be made by the Director of Engineering, as applicable. Security will be notified any time work is scheduled for a designated security-sensitive area.

Construction Site Safety Guidelines

The following notice shall be posted in a conspicuous location on the job site.

- All workers must wear identification badges.
- *Absolutely NO SMOKING.*
- *Fire extinguishers must be maintained on site and code compliant.*
- *Fire regulations must be posted.*
- Physical barriers extending from floor slab to slab above must be provided and maintained to separate construction area from hospital operations.
- Either a fire/smoke detection system or an extinguishing system must be active in the construction area.
- Walk off mat must be maintained to ensure that dirt is not being track out of construction site.
- All hospital exits or fire safety features that are compromised must be addressed by Interim Life Safety Measures.
- All staff must be trained/educated on worksite safety, hospital safety and patient related Issues as applicable (i.e. privacy, infection control).
- Any person entering the jobsite must wear a hard hat and other Personal Protective Equipment (PPE) as per OSHA requirements.
- Fall protection is required at all times at a height of 6 feet or greater.
- Jobsite and adjacent areas must be kept clean.
- Remove debris from jobsite on a daily basis.
- Maintain negative pressure relationship with respect to areas outside the jobsite.
- Safety Data Sheets for all chemicals used by contractors must be on-site and available for review.
- All OSHA, DOH & TJC safety regulations must be complied with.
- Contractor must obtain "Above Ceiling Work Permit" from Engineering prior to opening of ceiling in occupied areas. Seal all penetrations with approved fire stopping materials and assembly.
- All Hot Work requires a written request, approval and issuance of permit, prior to work commencing. Refer to Hot Work Permit requirements.

Hospital departmental management staffs must notify the Engineering Department any time their department is planning work by a vendor that has the potential to impact the physical plant such as: installation of equipment that could result in penetrations to walls, ceilings, floors; hot work (spark-producing work); work involving utility systems, i.e., electrical work, plumbing.

3. Preparation for Construction

To assure a safe, functional, and comfortable environment during construction, hospital personnel will review and implement as necessary fire safety, infection control, and engineering/maintenance measures including, but not limited to, the following:

Fire Safety:

- Ensure that exits provide free and unobstructed egress. All personnel should receive training if alternative or temporary exits are designated.
- Ensure free and unobstructed access for emergency services and emergency personnel.
- Ensure that the fire alarm, detection, and suppression systems are not impaired. A temporary but equivalent system must be provided when any fire system is not working. Temporary system is tested weekly.
- Ensure that temporary construction partitions are smoke-tight and built with non-combustible materials.
- Provide additional firefighting equipment i.e., extinguisher, and user training as necessary.
- Enforce smoking policy (NO SMOKING).
- Reduce the flammable and combustible fuel load by removing debris and excess storage in the work area.
- Ensure that adequate fire drills involving construction site and contiguous areas are conducted.
- Ensure enhanced hazard surveillance of building, grounds, and equipment with special attention to construction/alteration site.
- Train personnel to recognize when structural or compartmentation features of fire safety are compromised.
- Area worked in to be cleaned daily, e.g., no dangerous or sharp items protruding; holes in floors covered; no fire hazards; electric lines properly secured.

- Demolition care taken not to damage water, oxygen, vacuum, sprinkler, or electric lines in use. If service to the area must be turned off, this must be done by the hospital's Engineering personnel.
- Contact Engineering if above ceiling work is planned.
- Contact Engineering if hot work (spark-producing work) is planned; work involving burning, welding, soldering, or any condition exists that may set off smoke detectors. Sprinklers must be active in areas where hot work is performed; ABC and/or A-type portable fire extinguishers dedicated to the job must be present; PPE must be worn; caps must be replaced on tanks when completed. A valid Certificate of Fitness issued by the Nassau County Fire Marshal is required for person performing welding and/or cutting, using electric gas, or other methods.
- If furniture or equipment is in work site, move or cover to keep dust off. Place work mat inside work area at exist door to clean feet. Dust barriers to be erected as needed.
- Sheetrock partitions must extend from floor to slab above unless otherwise indicated. Track mechanically secured to both floor and ceiling. Twenty gauge studs to be used.
- All door bucks fastened to floor mechanically and secured with header on top. Studs secured with screws to buck tabs.
- Doors are 1-3/4" thick, solid core and rated where necessary, i.e., corridors, hazardous areas.
- All pipes, conduits, and ducts must be securely hung with proper hangers and clamps.
- All water and steam lines covered. All supply air ducts covered.
- All electric installation in new walls requires 1900 box and conduit secured with adequate clips. In existing wall Gem permitted, but secure with Madison clips. Raised covers for outlet boxes as required for shelters wall. All outlets and switches to hospital grade. GFCI protection is required during construction.
- All partitions must be taped, spackled and sanded until smooth wall is achieved. Sheetrock to be primed two (2) coats and then painted finish coat.
- Ceiling to be hung with #12 gauge wire, spaced no more than 5' apart, mechanically fastened to ceiling slab wherever possible. Extra wire supports where electric fixtures are hung.

- Contractors must supply their own compliant tools and equipment, i.e., brooms, shovels, ladders, extension cords, etc., that must be maintained in good repair. Contractors must supply their own materials for a job except if a specialty item is involved. We will assist with name of product, manufacturers and number of item if we have on record.
- All workers must wear identification badges issued by either the Hospital or the General Contractor. When working on a time and material job, ID badges must be retained for invoicing purposes.
- All dust walls or temporary walls constructed of metal studs and sheetrock, and/or rated plywood.
- Fall protection (anchorage point, harness, lanyard or double lanyard) shall be employed when any condition or work activity exposes a worker to a fall of six (6) feet or greater.

Infection Control: Maintain negative pressure in construction areas.

- Ensure that a physical barrier capable of containing dust and other particulate matter is maintained between the construction site and contiguous areas.
 - Ensure that construction doesn't interfere with proper utilization and separation of clean and soiled areas, i.e., workrooms, storerooms, etc.
 - Ensure that housekeeping is undertaken in and around construction site in a manner which affords a sanitary environment.
 - Ensure that waste removal, including ordinary refuse, construction debris, and regulated medical waste is stored and transported in appropriate container. Ensure prompt removal of all waste in and around construction site.
 - Ensure that isolation facilities are properly maintained and utilized in areas impacted by construction. This would include assessment of appropriate ventilation i.e., pressure, air changes, etc.
 - Ensure that cleaning, disinfection, and sterilization of supplies and equipment are properly carried out in areas impacted by construction.
 - Verify the continued practices of aseptic techniques in areas impacted by construction.
 - Ensure that clean supplies and equipment are stored and transported in a manner which affords protection from contamination during construction.
 - Ensure maintenance of clean linen and proper handling of soiled linen during construction.
 - Assure that food and medication are stored, transported, and served/administered to patients in a sanitary manner during construction.
- Maintain negative pressure in construction areas.

4. Personal Protective Equipment (PPE)

In accordance with NYUWH policy, all employees, agents, and/or visitors who are authorized to enter a construction site shall be required to wear, at all times while within the construction site, the following personal protective equipment: Head protection/helmet that meets ANSI Z89-1-1969 requirements; Eye protection with side shields compliant with ANSI Z87.1-20; Slip resistant sole footwear with safety toe compliant with American Society for Testing and Materials (ASTM) F2413-05 specifications; and High visibility safety vest or jacket compliant with ANSI Class II safety apparel.

The need for any extraordinary safety precautions inclusive of additional PPE requirements for personnel working or entering a construction site, such as hearing protection, respiratory protection, need for safety belts, etc., will be determined based on the involved work and environment.

In accordance with OSHA regulations, the Health System/Hospital provides applicable PPE to personnel.

5. Environmental Monitoring Program

An ongoing monitoring program focusing on fire safety and infection control will be undertaken once construction/alteration has commenced. The program will involve routine inspections of the construction site and contiguous areas, which will be performed by hospital personnel in the departments of Engineering and Safety. The below listed forms (samples attached) will be utilized to assist in the Environmental Health and Safety assessment and posted at job sites, as applicable:

- Pre-Construction Risk Assessment
- Interim Life Safety Measures Matrix
- Minimum Construction Site Requirements for Posting
- Daily Construction Site Inspection
- Hot Work Permit
- Above the Ceiling Permit

6. Record Keeping

Fire safety/infection control/safety assessments will be documented weekly and maintained on file in the Engineering Office. In addition, a quarterly summary of these assessments will be documented at the Safety Committee meetings.

7. Completion of Construction / Project

Upon project completion, a survey of the area will be performed by team members from various disciplines, as applicable, e.g., Engineering, Safety Services, Infection Control, Environmental Services, to review standards and code requirements applicable to the constructed/renovated area. Elements of a pre-occupancy survey include, but are not limited to, a review of ventilation, fire/life safety, furnishings, physical plant features / equipment and space necessary to meet the functional program.

ENGINEERING DEPARTMENT POLICY

	No:	ENG-01 (E)
SUBJECT:	Elevator Evacuation	
EFFECTIVE:	MARCH 1, 2016	REVISED: N/A
SUPERSEDES:	N/A	PAGES: 2
CROSS REFERENCE:		
APPROVED BY:	JOSEPH BURKE, VP ENGINEERING	

In the event of an elevator malfunction, passenger assistance can be obtained by calling Voice Communications with the emergency telephone in the elevator car, or by pushing the elevator button that indicates “Call and Hold”. The Voice Communication Operators have the ability to verify the elevator car by the telephone display. The following procedures will be initiated as soon as the elevator is identified:

- The operator will ask/determine if patients in need of immediate medical assistance are on the elevator.
- Voice Communications will contact Engineering and Security.
- Representative staff will respond to closest location to the stalled elevator.
- Verbal communication will be maintained with elevator passengers through telephone or by calling aloud in the vicinity of the stalled car.
- Engineering personnel will try to ascertain if “Stop” switch is in proper position or if the power is off.
- Hospital staff will standby and awaits the arrival of Emergency Elevator Service representatives if the issue cannot be easily and safely resolved.
- Clinical staff should try to determine status of occupants on elevator, and try to monitor their physical/mental condition.
- In the event of an extreme emergency that requires immediate removal of occupant(s):
 - ▶ Engineering will re-contact the elevator service company and stress the urgency;
 - ▶ Security will contact Police Emergency Services and request an elevator rescue;
 - ▶ Engineering will contact the Fire Department and notify them that an emergency elevator evacuation is needed.

If a previously trained Engineering employee is available, an attempt to reach the occupants can be made under limited circumstances. Refer to the Engineering Department Policy.

Under no circumstances shall any person or persons attempt to evacuate an individual from an elevator without FIRST disconnecting the main power source located in the elevator machine room and ENSURING THAT THERE IS NO POWER TO THE ELEVATOR.

ENGINEERING DEPARTMENT POLICY

	No:	ENG-01 (F)
SUBJECT:	Hand and Portable Power Tool	
EFFECTIVE:	MARCH 1, 2016	REVISED: N/A
SUPERSEDES:	N/A	PAGES: 8
CROSS REFERENCE:	OSHA 29 CFR 1910.242 & 29 CFR 1910.212-215	
APPROVED BY:	JOSEPH BURKE, VP ENGINEERING	

1. Introduction

1.1 It is the policy of NYU Winthrop Hospital (NYUWH) to take precautions to eliminate hazards associated with the use of hand and portable power tools; and to ensure employees are properly trained to utilize these tools in a safe manner to minimize injuries related to their use. This Hand & Portable Power Tool Safety Program prescribes the duty to maintain tools and equipment; use hand and portable power tools in a safe manner; and to minimize injury and/or accidents associated with their use.

2. Purpose

The purpose of this program is to outline the requirements to minimize/eliminate hand and portable power tool related injuries. This program is developed in accordance with the following Occupational Safety and Health Administration (OSHA) regulations:

- 29 CFR 1910 Subpart P, "Hand and Portable Powered Tools and Other Hand-Held Equipment"
- 29 CFR 1910.212-215- Machine guarding
- 29 CFR 1910.242 – Hand and portable powered tools and equipment, general
- 29 CFR 1910.243 – Guarding of portable powered tools
- 29 CFR 1910.244 – Other portable powered tools

3. Scope

This Hand & Portable Power Tools Safety Policy establishes and outlines the NYUWH Engineering department, supervisor, and user responsibilities; identification of safety hazards and control measures; and training, inspection and recordkeeping for NYUWH owned hand and portable power tools. The policy applies to all NYUWH employees whose work duties require them to utilize hand and portable power tools. All hand and portable powered tools and other hand-held equipment utilized at NYUWH for construction, alteration, repair, demolition, electrical, plumbing, vehicle maintenance, and general purposes are covered by this policy.

4. Responsibilities

Engineering Department

Engineering Department provides policy oversight and consultation to NYUWH employees who utilize hand and portable power tools; including training; maintaining

applicable records; performing program reviews and updates as necessary; and providing recommendations for safety procedures to supervisors and departments. Each department where hand and portable power tools are utilized is responsible for the following.

Ensure the applicable components of the Hand and Portable Power Tool Safety Program is available to employees.

Provide training to employees expected to utilize hand and portable power tools as part of their job duties.

Ensure hand and portable power tools are properly maintained and any equipment deficiencies are addressed to ensure employee safety.

Maintain manufacturer manuals and other applicable documentation related to the hand and portable power tools in use.

5. Supervisors

NYUWH employees who supervise personnel with responsibilities to work with hand and portable power tools must be informed of the contents of this program; identify authorized personnel to utilize equipment; address safety hazards in a timely manner; and ensure appropriate training is provided to all employees.

6. Authorized Person

Employees working with hand and portable power tools must be fully trained to ensure all applicable elements of the NYUWH Hand and Portable Power Tool Safety Policy are followed. In addition, employees are responsible for completing adequate training, reporting equipment deficiencies; and safe use of hand and portable power tools at all times.

7. General Safety Requirements

All hand and portable power tools must be maintained in a useable condition. The following applies to all hand and portable power tool maintenance and use to minimize hazards associated with their use.

- Maintain all tools in useable condition through following manufacturer recommendations for service; storing tools in the appropriate manner to minimize exposure to excessive temperature, humidity and corrosive materials; and reporting defects or deficiencies associated with tools to departmental supervisors upon discovery.
- Use the appropriate tool for the job. Hand and portable power tools are designed and manufactured for specific uses. Employees must use tools and equipment in the manner intended by the manufacturer. To prevent miss-use of existing equipment and to prevent injuries, the supervisor shall ensure the proper tools are available to complete a job; if a task is required to be completed by an employee where an appropriate tool is not present, the supervisor shall ensure the job is not completed until the appropriate tool is available.
- Prior to use, tools and equipment should be inspected by the user to ensure they are in proper working order with no defects or deficiencies, which may result in unsafe use or injury to the user. Damaged tools and equipment must be removed from service and tagged to ensure unauthorized use does not take place.
Always operate tools and portable power equipment according to the manufacturer's specifications. Failure to do so may result in injury to the user.

Machine Guards & Safety Switches

General requirement 1910.212 (a)(1) states that one or more methods of machine guarding must be used to protect operators and other employees from hazards including those created by point of operation, in-going nip points, rotating parts, flying chips and sparks.

Many tools and equipment protect exposed moving parts through various machine guarding techniques. Belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains, or other reciprocating, rotating, or moving parts are typically guarded with safety shields or switches.

Machine guards must be provided to protect the user from the following:

Point of operation hazards

In-running nip points

Rotating parts

Flying particles and sparks.

Machine guards directly cover a hazardous area of a tool or piece of equipment to prevent contact by the user. An example of a machine guard is the retractable cover on a circular saw, which exposes only the area of the blade performing the cutting action.

Safety switches are incorporated into many portable power tools to prevent unintended activation of the equipment. An example of a safety switch is a constant pressure switch, which requires the user to place pressure on the activation switch and releasing of the switch results in the tool shutting off or stopping.

Machine guards, safety switches, and any other safety elements of a tool or power tool, must not be removed, manipulated or tampered with in any way.

8. Personal Protective Equipment (PPE)

Employees who use hand and portable power tools and are exposed hazards, such as noise, vibration, particulate, sparks/chips, abrasive, splashing objects, harmful dusts, fumes, mists, vapors and/or gases must be provided with the appropriate personal protective equipment (PPE).

The following considerations should be evaluated, at a minimum, in the selection and use of PPE when utilizing hand and portable power tools.

Eye protection - Safety glasses or goggles must be worn at all times when using hand and portable power tools.

A face shield may be used in addition to safety glasses or goggles to protect the face and neck.

Foot protection – Appropriate foot protection, which may include closed toed shoes or steel-toed boots, must be worn when working with hand and portable power tools.

Hearing protection – If the tool or equipment being utilized generates excessive noise, the use of hearing protection may be necessary. Follow the manufacturer's recommendations for hearing protection.

Hearing protection is recommended during the use of certain hand tools and all portable power tools.

Respiratory protection – Tools and equipment, which generate excessive dust, may

require the use of a particulate filtering respirator.

Hand protection – Whenever there are sharp objects or elevated temperatures associated with the work being conducted, adequate hand protection must be provided to the employee performing the work.

Body protection – Depending on the hazard present, appropriate clothing must be worn during the use of hand/portable power tools.

Hair Protection – Long hair must be tied back and secured during the use of power tools to prevent hair being caught in moving parts.

9. Hand Tool Safety

Hand tools are tools that are powered manually and do not require additional power sources such as electric, hydraulic, compressed air, etc. Examples of hand tools include anvils, axes, hammers, planers, pliers, punches, saws, screw drivers, tin snips, and wrenches.

Hazards associated with hand tools are typically associated with misuse of the equipment and/or improper maintenance of the tools. To prevent injury when utilizing hand tools, the following precautions should be taken.

Use hand tools only for their intended purposes. For example, using a screwdriver as a chisel may result in the tip of the screw driver breaking and becoming a flying particle hazard.

Inspect hand tools for damage prior to use

Maintain hand tools in good working condition and free from damage. Handles of tools should be maintained free from grease and oil to prevent slipping and deterioration of the materials of construction. Damaged hand tools must be removed from service and repaired or replaced.

When using tools, such as knives, saws, or other cutting devices, always direct the tool away from the worker and any other personnel in the area.

Maintain cutting tools so that the cutting edges are sharp. Dull cutting edges may present additional hazards.

Cracked cutting blades must be removed from service and replaced.

Wrenches must be used to prevent slippage, to prevent injury to the user.

Impact tools, such as chisels, drift pins, and wedges must be kept free from mushroomed heads.

Iron or steel hand tools may produce sparks when struck. Ensure the use of iron and steel tools does not occur near flammable or combustible materials. If flammable or combustible materials are present, ensure the use of non-sparking hand tools.

Maintain both the work area and tools in a clean and organized manner. This will help prevent potential injuries.

Wear the appropriate PPE.

10.0 Portable Power Tool Safety

Portable power tools must be equipped with safety mechanisms as described in section 3.2 of this program. Portable power tools, when used improperly, can result in serious injury or death.

Types of portable power tools are determined by their power source, each of which will be addressed in this program, and include electric, pneumatic, liquid fuel, hydraulic, and

powder actuated portable power tools.

To reduce hazards associated with the use of portable power tools, employees should observe the following general safety practices.

Read and understand the owner's/user manual for each portable power tool expected to be used by the employee. The manual should address the tool's proper use, limitations, proper operation, hazards, PPE, storage and maintenance practices applicable to the equipment.

Tools should not be carried or lowered from an elevated position by the power cord.

Never pull a power cord or hose as a means to disconnect it from a power source.

Ensure cords and hoses are kept clear from heat, oil and sharp edges during use.

Ensure tools are properly grounded during use. Use a ground fault circuit interrupter (GFCI) for corded tools.

When not in use, before service, cleaning and during blade/bit replacement procedures; power tools should be disconnected from their power source.

When portable power tools are in use, unauthorized personnel must be kept clear of the work area. Utilize appropriate signage to indicate when portable power tools are in use and clearly define restricted areas.

It may be necessary to secure the work area with clamps to allow for proper use of equipment when two hands are required to be on the power tool during use.

To avoid accidental start-up of power tools, do not hold fingers on the triggers during transportation of equipment.

Maintain tools in a clean manner free from oil and grease.

Maintain cutting surfaces in a sharp manner. Dull cutting edges present additional hazards.

When operating power tools, ensure adequate footing and maintain good balance while in use.

Wear appropriate PPE during the use of power tools including hand, head, eye, foot, hearing, respiratory and body protection. Loose clothing, long hair, ties, or jewelry can become caught in moving parts; therefore ensure employees are appropriately dressed to perform the necessary work with portable power tools.

Inspect portable power tools prior to use. Any defects or deterioration of the equipment should result in the tool being removed from service. Portable power tools removed from service due to defects must be tagged with "DO NOT USE" or the equivalent to prevent unauthorized use.

11.0 Electric Power Tools

Employees utilizing electric powered portable tools must be aware of many hazards associated with their use. One common hazard with all electric power tools is the possibility of burns, shock or electrocution. Even a slight shock or small burn can cause a worker to fall from a ladder or result in serious injury depending on the work conditions.

To protect users from shock hazards, electrical power tools must have a three wire cord with a ground prong and be properly grounded during use.

Three-wire cords contain two current carrying conductors and a grounding conductor.

One end of the grounding conductor connects to the tool's metal housing; the other end is grounded through a prong on the plug.

The third prong on the electrical cord of power tools must never be tampered with or

removed for any reason.

Some tools are equipped with double-insulated electrical cords, which contain an internal layer of insulation to isolate the external housing of the tool, and do not have a ground prong. Only double-insulated cords are permitted to be used without a ground wire.

The following general practices should be followed when utilizing electric power tools. Electric power tools must be operated as intended and specified by the manufacturer. Utilize the appropriate PPE when utilizing electrical power tools.

Work areas should be well lighted.

Ensure cords associated with the use of power tools do not present excessive trip hazards.

Electrical power tools should be inspected prior to use. Any defects in the tool or wiring must result in the tool being taken out of service and marked "DO NOT USE" or similar to prevent unauthorized use.

Electric Saws – portable or semi-portable electric power saws can include circular, table, saber, radial arm, miter, and band saws. The following outlines the safety precautions to take when working with these types of saws.

Circular Saw – A portable saw using a toothed metal cutting disc/blade used for cutting wood, metal and concrete depending on the blade being used.

Portable circular saws with blades greater than 2 inches in diameter must be equipped at all times with guards. An upper guard must cover the entire blade of the saw. A retractable lower guard must cover the teeth of the saw, except where it makes contact with the work material.

The lower guard must automatically return to the covering position when the tool is withdrawn from the material being cut.

Table Saw – portable/semi-portable cutting tables with a fixed, toothed blade used for cutting longer lengths of wood and ensuring flush cuts.

The blade on a table saw must be adjustable in height to allow the user to adjust the blade no more than 1/8 inch above the material to be cut.

Ensure the material set to be cut does not contact the blade when starting or stopping the saw.

Keep the body away from the saw.

Use a push stick to keep hands and fingers away from the cutting blade.

Guards covering the blade at all times should operate freely when the material to be cut is introduced to the saw blade.

When not in use, lower the blade fully below the tabletop to prevent inadvertent contact.

Saber Saw – a portable reciprocating saw used to make custom cuts in wood or metal.

Always select the blade appropriate for the material being cut.

Ensure the blade is sharp. Dull blades can present additional hazards.

Do not turn on the saw when the blade is in contact with the material to be cut. This may cause the tool to "jump" or chip the material to be cut.

Ensure the material to be cut is secure to prevent movement during cutting.

Keep hands and other objects free from the cutting area at all times.

Radial Arm Saw – a semi portable saw equipped with a cutting table where the saw blade is above the table and moved along a rod to allow for flush cutting.

The material to be cut should be placed firmly against the saw's back guide.

The blade should rotate downward.

Pull the saw with one hand and hold the wood with the other, ensuring it is clear from the cutting area.

Never reach across the line of a cut.

Return the saw to the rear position after completing a cut.

Radial arm saws should be equipped with blade guards, which operate freely when contacting materials being cut.

Miter Saw – portable/semi-portable saw used to cut flush angles on materials with a pull down blade.

Miter saws use a downward cutting motion; therefore, keep hands and fingers well outside the cutting area.

Miter saws must be equipped with a blade guard, which must operate freely when the blade contacts the material to be cut.

Only use the manufacturer specified blade sizes and rpm ratings.

When changing saw blades ensure all bolts are adequately tightened and secured to the saw.

Band Saw – a portable/semi-portable saw used for precision cuts on wood and metal with a rotating belt blade.

Set the blade evenly and with the correct tension before cutting.

Push the cutting item through the blade with both hands on either side of the blade ensuring hands and fingers are clear of the cutting area.

Ensure guards are in place.

Drills – electric power drills are typically used to put holes in various materials including wood, metal, concrete and brick; and can be equipped with a hammer function.

When operating a drill, use the proper size and type of bit for the job. Ensure the bit is sharp and not damaged.

Ensure the chuck is secured to the spindle. Tighten the bit securely as outlined in the owner's manual. Remove the chuck key prior to starting the drill.

Ensure the handles are securely attached.

When drilling, brace the drill to prevent torque on the hands/wrists.

Never force a drill. Forcing a drill can cause the motor to overheat and damage the bit.

Apply the appropriate pressure for the job. If the drill slows, relieve the pressure.

Portable Abrasive Wheel Tools – portable tools used to grind, cut, polish, buff, etc. through a rotating wheel attached to the tool body, which typically generate large amounts of dust and particulates during cutting operations.

Abrasive wheel tools must be equipped with guards that cover the spindle end, nut and flange projections; maintain proper alignment with the wheel; and do not exceed the strength of the fastenings.

Inspect wheels before use. Any damage or defects must be addressed prior to use. To ensure cutting wheels are not cracked, tap with a non-metallic instrument. If the wheel sounds cracked or "dead" it could disintegrate during use and must not be used. A stable and undamaged wheel, when tapped, will give a clear metallic tone or "ring".

Abrasive wheels must fit freely on the spindle. If a wheel is installed too tightly it may crack during use. Always follow the manufacturer's instructions on wheel replacement.

Allow the wheel to reach optimal operating speed before conducting cutting, grinding, buffing, etc. operations.

Stand clear of flying particles coming from the tool during use if possible.
Always utilize the appropriate PPE when using powered abrasive cutting tools including, but not limited to, eye/face, hand and body protection.
Turn off and unplug abrasive grinding tools when not in use.
Never clamp a grinding tool in a vise or to a surface to perform a function.

12.0 Pneumatic Power Tools

Pneumatic tools are powered by compressed air and include chippers, drills, hammers, sanders, and nailing tools, etc. Hazards associated with pneumatic power tools include noise, vibration, fatigue, and struck by.

ANSI approved eye protection is required anytime employees are working with pneumatic tools. A significant hazard of using pneumatic power tools is being struck by one of the tool's attachments or by a fastener used with the tool.

Ensure the air hose is securely attached to the tool being used prior to activating the tool to minimize the potential for the hose disconnecting during use.

Air hoses greater than 1/2 inch in diameter must be equipped with a safety excess flow valve to shut off the air automatically in case the hose breaks.

All pneumatic tools should be equipped with safety clips or other safety elements to prevent the release of tool parts during use. Safety features of pneumatic tools must not be tampered with or altered in any way.

Pneumatic tools, which shoot nails, rivets, staples, or similar fasteners and operate at pressures above 100 psi, must be equipped with a muzzle safety feature to prevent fasteners from firing unless the muzzle is pressed against the materials to be fastened. Never pull the muzzle safety switch back manually to fire fasteners for any reason.

Pneumatic paint spray equipment must be equipped with safety switches to prevent accidental discharge of paint.

When using pneumatic power tools, ensure the work area is isolated to prevent unauthorized access.

Compressed air should not be used for cleaning purposes at pressures greater than 30 psi.

13.0 Hydraulic Power Tools

Hydraulic power tools utilize pressurized lines filled with hydraulic fluid to provide the pressure. The fluid within hydraulic power tools must be an approved fire-resistant fluid and must retain its operating characteristics at the most extreme temperatures to which it will be exposed.

Follow the manufacturer's recommendations for safe operating pressures for hoses, valves, pipes, filters, and other fittings at all times.

Hand-held power tools, powered by hydraulic lines must be equipped with a constant-pressure switch, or a control that shuts off the power when pressure is released.

This includes drills, tappers, fastener drivers, angle grinders (with wheels greater than 2 inches in diameter), disc sanders (with discs greater than 2 inches in diameter), belt sanders, reciprocating saws, saber saws, scroll saws, jig saws and other similar tools. Hydraulic jacks, including lever, ratchet, and screw jacks, must have a stop indicator, and the stop limit must not be exceeded.

Load limits must be determined by the manufacturer and be marked on the jack. Load

limits must not be exceeded.

A jack should be used to raise a load, but not fully support a lifted load. Once raised, blocking should be placed firmly under the base of the load.

14.0 Training Requirements

Employees expected to utilize hand and portable power tools as part of their job duties must be adequately trained prior to using such tools.

Employees should be trained in the following areas:

Be able to recognize hazards associated with different types of tools and equipment; and the safety precautions necessary for use. The PPE required to be worn during the use of tools.

The proper use of hand and power tools and other hand-held equipment

Be able to recognize defects in tools, which may render them out of service.

When applicable, provide access to the manufacturer specifications and manual's for specific equipment to be used.

Department-developed standard operating procedures (SOPs) outlining specific safety precautions for certain tools or activities.

Retraining may be necessary to maintain employee knowledge of working with tools or if a near-miss or injury has occurred.

15.0 Record Keeping

The Engineering Department must maintain the following records as part of the hand and portable power tool safety program.

Employee training records

Manufacturer specifications/manuals

Maintenance/service records

ENGINEERING DEPARTMENT POLICY

	No:	ENG-01 (G)
SUBJECT:	Ladder Requirements	
EFFECTIVE:	MARCH 1, 2016	REVISED: N/A
SUPERSEDES:	N/A	PAGES: 6
CROSS REFERENCE:	ANSI ASC / OSHA	
APPROVED BY:	JOSEPH BURKE, VP ENGINEERING	

1. Introduction

Code of Federal Regulations (CFR) Title 29 Part 1910.25 addresses portable wood ladders. It is divided into application, materials, construction requirements and ladder care and usage.

2. Purpose

This regulation applies to common types of portable wood ladders and not to specialty ladders such as shelf ladders, combination step and extension ladders, stockroom and aisle-way stepladders and library ladders. Portable stepladders must not be longer than 20 feet and are specified as Type I, Type II or Type III stepladders.

Wood ladders should be constructed of a high-density wood that is free of sharp edges and splinters. Visual inspection should reveal no decay, or irregularities including shake, wane and compression failures or other weaknesses. Construction requirements include ladder length restrictions (see Table #1) and step spacing. Uniform step spacing must not exceed 12 inches.

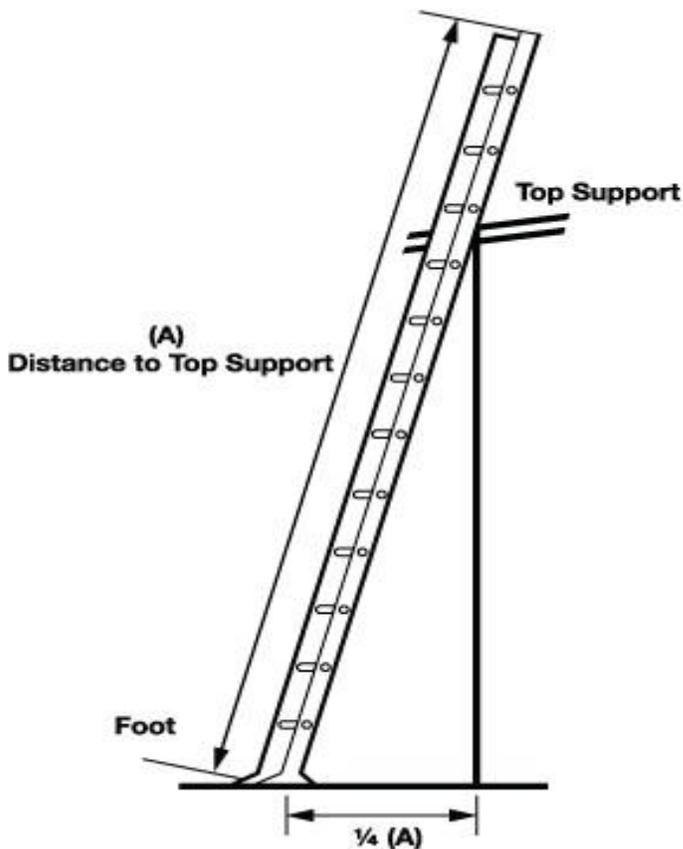
Ladder Type	Maximum Length	Special Requirements
Type I - Industrial Stepladder	3-20 ft.	The minimum width between side rails at the top, inside to inside, is 11-1/2 inches. From top to bottom, the side rails must spread at least one inch for each foot of stepladder length. Each stepladder must have a metal spreader or locking device of sufficient size and strength to securely hold the front and back sections in open positions.
Type II - Commercial Stepladder	3-12 ft.	Same as above.
Type III - Household Stepladder	3-6 ft.	Same as above.
Rung Ladder	30 ft.	None.
Two-Section Rung Ladder	60 ft.	Ladder rails must fit into each other. Upper section can be raised/lowered.
Trestle Ladder	20 ft.	None.

Painter's Ladder	12 ft.	None.
Mason's Ladder	40 ft.	None.
Side-Rolling Ladder	20 ft.	None.

Care and usage requirements ensure the serviceability and safety of portable wood ladders. Ladders should be maintained in good condition by keeping all joints tight; lubricating all wheels, locks and pulleys; replacing worn rope; and doing routine cleaning. Those that are defective must be withdrawn from service for repair or destruction and tagged or marked "Dangerous, Do Not Use".

Usage requirements involve placing the ladders at an angle so they are one foot away from the wall for every four feet of working ladder height (see Figure #1); allowing only one person at a time on a ladder; not placing the ladder on top of other objects to increase height or in front of doorways; and extending the ladder three feet over a point of support if climbing to a rooftop, among others.

Figure #1:



Portable Metal Ladders

29 CFR 1910.26 addresses portable metal ladders, and is divided into general requirements, care and maintenance. The general requirements call for ladders that are free of sharp edges and are structurally sound. Metal ladders must have rungs that are knurled, dimpled or treated to improve slip resistance. OSHA also places ladder length restrictions on portable metal ladders (see Table #2). Uniform step spacing must not exceed 12 inches.

Proper care and maintenance of portable metal ladders extends ladder life and improves user safety. If a ladder tips over, it must be inspected for damage (bends or dents, loose rivets or joints, etc.) and if defective, must be marked and taken out of service for repair. Ladders must be kept clean so they do not become slippery.

Portable metal ladders are designed for: use by only one person; a 200-pound load capacity; secure footing and support for both top rails. Like wooden ladders, metal ladders must be placed at an angle so they are one foot from the wall for every four feet of working ladder height (see Figure #1).

Table #2

Ladder Type	Maximum Length	Special Requirements
Single-Section Ladder	30 ft.	The minimum width between side rails of a straight ladder or any section of an extension ladder should be 12 inches.
Extension Ladders: Two-section:	48 ft.	The length of single ladders or individual sections of ladders should not exceed 30 feet. Two-section ladders must not exceed 48 feet in length, and ladders of more than two sections must not exceed 60 feet in length.
Extension Ladders: Greater than Two-Section Ladder	60 ft.	Overlap stops required.
Stepladder	20 ft.	Insulating, nonslip pads at bottom of rails. Must have locking device to hold ladder sections open.
Platform Ladder	20 ft.	None.
Trestle Ladder/Extensions	20 ft.	None.

ANSI Standards

ANSI consensus standards on portable ladders include **ANSI ASC A14.1-2007** for wood ladders, **ANSI ASC A14.2-2007** for metal ladders, **ANSI ASC A14.5-2007** for reinforced plastic ladders and **ANSI ASC A14.7-2011** Safety Requirements for Mobile

Ladder Stands and Mobile Ladder Stand Platforms. These standards detail the various materials, construction requirements, test requirements, usage guidelines and labeling/marketing requirements.

Material Guidelines

ANSI recommends various species of wood that are suitable for ladders. Physical characteristics such as grain, knot, pitch and compression must be controlled in constructing ladders. Metal ladders do not have material guidelines. Reinforced plastic ladders must use fully cured, commercial-grade, thermosetting polyester resin with glass-fiber reinforcement. The environment the finished ladder will encounter (electrical hazards, temperature extremes, corrosion, outdoor weathering, etc.) should determine the material.

Construction Requirements

Construction requirements include weight and size categories for portable ladders. Size categories vary for wood, metal and reinforced plastic materials. The five ladder types and their duty ratings are shown in Table #3.

Table #3

Ladder Type	Duty Rating	Description
Type IAA Ladder	375 lb.	Extra-heavy-duty industrial ladder
Type IA Ladder	300 lb.	Heavy-duty industrial ladder
Type I Ladder	250 lb.	Heavy-duty industrial ladder
Type II Ladder	225 lb.	Medium-duty commercial ladder
Type III Ladder	200 lb.	Light-duty household ladder

Test Requirements

Test requirements for the three ladder materials vary. However, ladders generally are evaluated on their resistance to bending, strength in various positions and the quality of the individual components that make up the ladder.

Usage Guidelines

Usage guidelines for portable ladders encompass selecting the proper ladder for the job being performed; inspecting before use to verify proper operation and cleanliness; evaluating ladder placement so that footing and top supports are secure and not creating a traffic hazard for pedestrians; utilizing proper climbing technique; and caring for and storing ladders properly.

Marking Requirements

Ladders must be marked with ladder size, type, maximum length, number of sections (if appropriate), highest standing level, total length of sections (if applicable), model number, manufacturer's name, manufacturer's location and date of manufacture. Usage guidelines and other warning statements must also be placed on the ladders in specific locations depending on ladder type.

Mobile Ladder Stands and Mobile Ladder Stand Platforms

ANSI ASC A14.7-2011 covers mobile ladder stands and mobile ladder stand platforms. Mobile ladder stands are movable, fixed height, self-supporting ladders consisting of steps, which give access to the top step. These are designed and intended for one person only. Mobile ladder stand platforms are movable, fixed height, self-supporting units having at least one standing level with means of access or egress to the platform(s). The assembly may be designed and intended for one or more persons.

Requirements

Specific design and construction requirements are not spelled out because of the wide variety of materials and design possibilities. Mobile ladder stands and platforms must be designed to withstand four times their rated load and all exposed edges should be constructed with smooth edges.

Design Features

Steps should be constructed of non-skid surface, uniformly spaced with a rise of no more than 10 inches and at least 16 inches wide. Platforms should be 18-inches wide. Ladder stands with a top step height of four feet to 10 feet must be provided with handrails. Ladder stand platforms with a platform over 10 feet must have guardrails and toe boards on exposed sides and ends of the platform. Guardrails must have a height of 42 inches \pm three inches including a mid-rail. On special use applications, the use of removable gates or non-rigid members, such as chains, is allowed.

Product Performance

Units must be able to pass the prescribed stability and load tests. Compliance labeling must meet durability testing for environmental concerns such as humidity, water, temperature and adhesive strength.

Proper Care and Use

- Ladder stands must never be moved while occupied.
- Units must not be loaded beyond the rated capacity.
- Units should be used on level surfaces only.
- Materials should not be stored on the steps.
- Overreaching while on the ladder stand can cause instability and result in a fall.

- Consult manufacturer's care and use instruction manual.

Remember the acronym C.L.I.M.B. supplied courtesy of Louisville Ladder:

C: Choose the right ladder for the job

L: Look for damaged or missing parts

I: Insure a safe, stable setup

M: Move carefully, using three points of contact

B: Be a safety expert, not a statistic

Proper Procedure

Before working with a ladder, read the manufacturer's instructions. Do not use a ladder if sleepy or ill, if you are taking medication, or if there's bad weather. Do not use ladders in doorways or other high-traffic areas. If a ladder must be used near a door, make sure the door is locked and it is marked with warning signs and/or cones. If the door has to be open and the ladder is in a raised position, ask a coworker to stay with the ladder to make sure an accident does not occur. Use fiberglass or wood ladders, rather than metal, near power lines or other sources of electricity to avoid electrical shock hazards. Inspect your ladder for damage before using. If you find it is damaged during your inspection, remove the defective ladder from service and identify it with a "Do Not Use" tag.

Proper Setup

Choose the right ladder for the job. Check the label to make sure it has the proper duty rating and it is long enough for the work to be completed safely. The feet of a ladder should be level and positioned solidly on the ground. If the ground is soft or uneven, use boards under the legs for support. Test the ladder to verify that it is secure. For stability, both sides of the ladder need to be against the wall or other support. The legs on a stepladder should be spread fully and locked into position. Portable ladders must be placed at an angle so they are one foot from the wall for every four feet of working ladder height.

How to Climb

Make sure hands, shoes and ladder rungs are dry. Use a second person to hold the bottom of the ladder and prevent others from disturbing it. Keep a three-point grip on the ladder at all times (two hands and one foot or one hand and two feet). Avoid distractions that make you turn away from the front of the ladder. Climb slowly with weight centered between side rails. Do not lean back and never stand on the top two rungs of a stepladder or top four rungs of an extension ladder.

ENGINEERING DEPARTMENT POLICY

	No:	ENG-01 (H)
SUBJECT:	LEAD STANDARD	
EFFECTIVE:	MARCH 1, 2016	REVISED: N/A
SUPERSEDES:	N/A	PAGES: 3
CROSS REFERENCE:	OSHA (29 CFR 1910.1025)	
APPROVED BY:	JOSEPH BURKE, VP ENGINEERING	

1. Introduction

Lead Identification

There is a common misconception that lead can be absorbed through skin; lead itself is not absorbed through the skin. Lead is absorbed into the body through inhalation (breathing) and ingestion (eating). When lead is present in the air as a dust, fume or mist, it can be inhaled through your lungs and upper respiratory tract. The most common source of lead absorption in the industry is inhalation. Generally, lead that is absorbed through ingestion stems from contaminated hands, food, water, cigarettes or clothing. Lead entering the respiratory and digestive systems is released to the blood and distributed throughout the body.

2. Purpose

If lead is present in the workplace in any quantity, OSHA requires NYU Winthrop Hospital (NYUWH) to make an initial determination of whether the action level of lead is exceeded for any employee. This initial determination must include monitoring of the air for the presence of lead and must cover the exposure of a representative number of employees who are reasonably believed to be exposed to the highest lead levels. If any employee has reported symptoms of lead overexposure, or if there are any observations or indications that conditions suggest lead overexposure, the employer must include this information in the initial determination.

OSHA does not require that each individual employee be tested; rather it requires the employer to test a representative number of employees and job types. The air samples taken must be representative of each employee's regular, daily exposure to lead. Enough sampling must be done to make sure that each employee's exposure level is reasonably represented by at least one full-shift (at least seven hours) sample. If the results of the monitoring indicate a presence of lead greater than the PEL (without regard to the use of respirators) the employer is required to notify the employee in writing and provide a description of the action which will be taken to protect the employee from lead hazards.

Once lead is absorbed into the bloodstream, it circulates throughout the body and is stored in bones, various organs and body tissue. While some of the lead is excreted, some will stay in the organs and body tissue. As the exposure to lead continues, the

amount stored in the body increases, while the amount excreted decreases. Lead stored in the tissues slowly causes irreversible damage to the individual cells, then to the organs and eventually to all body systems.

Lead levels must be rechecked every six months if the exposure level exceeds the action level and every three months if it exceeds the PEL. Monitoring can stop if the employer has monitored for lead twice, testing at least two weeks apart, with results lower than the action level.

Lead exposure monitoring can be done in the following ways:

1. Determination of air concentrations. (Follow [NIOSH testing method 7082](#) or an equivalent.) Two pieces of equipment are needed for this, a personal air sampling pump and a membrane filter. These can be attached to an employee for personal monitoring or used for area monitoring.
2. Determination of water concentration. Obtain a water test kit or submit a sample to an analytical laboratory of your choice.
3. Determination of soil concentration. Obtain a soil test kit or submit a sample to an analytical laboratory of your choice.
4. Determination of blood lead level. Determined by a blood sample taken by a physician.
NOTE: OSHA's exposure level for lead in blood is 50 micrograms per deciliter ($\mu\text{g}/\text{dl}$).
5. Determination of surface lead level. Can be determined by convenient test kits.
NOTE: Once the lead level is determined, it should be compared with the recommended level.

Lead Protection

The employer is required to provide respiratory protection and protective clothing for those exposed to lead levels above the PEL. If an employee requests respiratory protection at any time, the employer must provide the protection even if the employee's exposure is below the PEL. Common reasons for an employee requesting respiratory protection when they're below the PEL would be if they received medical advice that required them to lower their lead exposure levels or if they would like to have children in the near future. For more information on respiratory protection, please refer to [29 CFR 1910.1025\(f\)](#). For personal protective clothing information, refer to [1910.1025\(g\)](#).

Safe Lead Work Practices

1. Provide exhaust ventilation.
2. Use only [high-efficiency particulate absolute \(HEPA\) vacuums](#) for cleanup.
3. Use National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH/MSHA)-approved respirators. (The type will be determined by the exposure level.)
4. Do NOT eat, drink or smoke in lead-contaminated areas.

5. Use proper protective clothing, shoe covers and gloves.
6. Wash hands thoroughly before eating.
7. Shower and change into clean clothes before leaving worksite.

Lead Prevention Training

OSHA guidelines require comprehensive training for everyone who may be potentially exposed to lead. [\(29 CFR Part 1910.1025\(l\)\)](#).

Lead Signs and Labels

Signs must be posted in each work area where the PEL is exceeded. These signs must be illuminated and cleaned as necessary to ensure legibility [\(29 CFR Part 1910.1025\(m\)\)](#).

OSHA has updated the language for workplace signs to incorporate guidance from the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). The update is effective June 1, 2016 for signs.

The language for signs required after June 1, 2016 is:

**DANGER
LEAD
MAY DAMAGE FERTILITY OR THE UNBORN CHILD
CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM
DO NOT EAT, DRINK OR SMOKE IN THIS AREA**

Per the protective work clothing and equipment cleaning and replacement guidelines [\(1910.1025\(g\)\(2\)\(vii\)\(A\)\)](#), as of June 1, 2015, employers are required to label bags or containers of contaminated protective clothing and equipment with the following:

DANGER: CLOTHING AND EQUIPMENT CONTAMINATED WITH LEAD. MAY DAMAGE FERTILITY OR THE UNBORN CHILD. CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM. DO NOT EAT, DRINK OR SMOKE WHEN HANDLING. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS.

ENGINEERING DEPARTMENT POLICY

	No:	ENG-01 (I)
SUBJECT:	WARNING SIGNS	
EFFECTIVE:	MARCH 1, 2016	REVISED: N/A
SUPERSEDES:	N/A	PAGES: 5
CROSS REFERENCE:	OSHA REGULATION: 29 CFR 1910.145	
APPROVED BY:	JOSEPH BURKE, VP ENGINEERING	

1. Introduction

In the fall of 2013, OSHA endorsed the latest best practices related to safety signs by referencing the 2011 ANSI/NEMA Z535 safety sign and tag standards in its regulations. The new sign and tag formats use nationally and internationally standardized elements to better convey safety messages in today's workplace

2. Purpose

Danger Signs– Indicate immediate danger and that special precaution are necessary. OSHA specifies that red, black and white colors are to be used for danger

Caution Signs– Warn against potential hazards or caution against unsafe practices. OSHA specifies that caution signs must have a yellow background and black panel with yellow letters. All letters used against the yellow background must be black

Safety Instruction Signs– Must be used where there is a need for general instructions and suggestions relative to safety measures. OSHA specifies that safety instruction signs must have a white background, green panel and white letters. Any letters used on the white background must be black.

- **Safety Alert Symbol**

- Indicates a potential personal injury hazard exists.
- It is only used on DANGER, WARNING and CAUTION signs, labels and tags.



- Signal Words for Hazard Alerting Safety Messages

- **DANGER**
- Indicates a hazardous situation that, if not avoided, will result in serious injury or death.
- Its use should be limited to the most extreme situations.
- **WARNING**
- Indicates a hazardous situation that, if not avoided, could result in serious injury or death.
- **CAUTION**
- Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

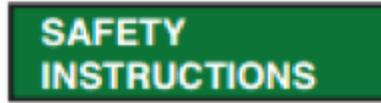


- Signal Words for Non-Hazard Alerting Safety Messages
- **NOTICE**
- Indicates information considered important but not directly hazard related (e.g., security, hygiene, equipment or property damage).



- Signal Words for Instructional Safety Messages
- **SAFETY INSTRUCTIONS**
- Used to provide explanatory information like procedures and instructions.

- More definitive words can be used in this signal word panel (e.g., LOCKOUT PROCEDURE).



- **Symbols**

- Graphical symbols used to help bridge language barriers and draw attention to the safety message.
- Specific shape, color and design principles are used to meet global compliance objectives.



Employers can use either the ANSI standards from 1967-1968 (ANSI Z35.1 and Z35.2) or from 2011 (ANSI Z535.1, Z535.2 and Z535.5) for safety signage. This allows employers to use either the old or new format, and be in OSHA compliance.



Lettering Size

The wording on any safety sign should be concise and easy to read, according to ANSI Z535.2-2011, Section 8. The size of the lettering must be of a size that enables a person with normal vision, including corrected vision, to read the safety sign message panel text at a safe viewing distance from the hazard. The signal word letter height should be at least 50% greater than the height of a capital H in the message panel wording. The minimum safe viewing distance refers to the closest distance a person can be to the sign and still have time to follow the safety sign's message to avoid the hazard.

Placement of Signs

Hazard alerting signs must be placed to alert and inform viewers from a safe viewing distance, according to ANSI Z535.2-2011, Sections 11 and 12. They must be legible, and must not be a distraction or create a hazard themselves. They must not be placed on or adjacent to moveable objects like doors, windows, etc. Safety and fire equipment signs must be clearly visible in the immediate vicinity of the equipment. Safety signs must be protected from damage caused by fading and other potential environmental conditions. Signs must be displayed with illumination or retro reflective as needed for adequate legibility under normal operating conditions. Where illumination is inadequate or colors are not recognizable, supplemental illumination must be used. Where illumination may be interrupted, the sign should be made with photo luminescent and/or retro-reflective materials, and/or equipped with emergency lighting.

Safety Color Coding

The following chart represents the color codes of both ANSI/NEMA Z535.1-2006 (R2011) and OSHA:

COLOR	MEANING	APPLICATION
Red	Danger	Safety cans and signs.
	Stop	Emergency stop bar or button on machinery. Identification of fire equipment.
Fluorescent Orange, Orange-Red	Biosafety	Labels and containers for blood and infectious waste. (Warning labels must be fluorescent orange or orange-red with the biosafety symbol in a contrasting color.)
Yellow	Caution	Tripping, falling and striking hazards. "Flammable, Keep Fire Away" labels on cabinets. Safety cans and containers for explosives, corrosives or unstable materials.

Orange	Warning	Parts of machinery or energized equipment that may cut, crush or otherwise injure. Inside of transmission guards for pulleys, gears, etc.
Green	Safety	Location of first aid equipment, safety equipment, respirators, safety showers.
Blue	Information	Signs and bulletin boards. Specific railroad warnings against starting, using or moving equipment being repaired.
Black, White, Yellow or Combination of Black with White or Yellow	Boundaries	Traffic or housekeeping markings. Stairways, directions and borders.
Magenta or Purple on Yellow	Radiation Caution	X-ray, alpha, beta, gamma, neutron and proton radiation.

ENGINEERING DEPARTMENT POLICY

	No:	ENG-01 (J)
SUBJECT:	WELDING, CUTTING, AND BRAZING (“HOT WORK”)	
EFFECTIVE:	MARCH 1, 2016	REVISED: N/A
SUPERSEDES:	N/A	PAGES:
CROSS REFERENCE:	OSHA 29 CFR 1910.252	
APPROVED BY:	JOSEPH BURKE, VP ENGINEERING	

1. Introduction

1. This procedure follows requirements set forth in 29 CFR 1910.252.
2. This policy applies to all “Hot Work” operations being done at NYU Winthrop Hospital (NYUWH)

2. Purpose

The purpose of “Hot Work” guidance is to provide written procedures to prevent the outbreak of fire, fire alarm activations, and smoke and odor migrations in NYUWH buildings, including Hospital owned properties, resulting from any temporary operation involving the use of open flames or which produces heat and/or sparks. This includes but is not limited to: brazing, cutting, grinding, torch soldering, thawing pipes, torch applied roofing, and welding.

3. Definitions

“Hot Work” means any operation producing flame, sparks or heat including cutting, welding, brazing, grinding, sawing, torch soldering, thawing frozen pipes, applying roof covering etc.

“Hot Work Area” means the area exposed to sparks, hot slag, radiant heat, or convective heat as a result of the “Hot Work”.

“Hot Work Equipment” means electric or gas welding or cutting equipment used for “Hot Work”.

“Hot Work Permit” means a special permit, which authorizes “Hot Work” activities at a specific location and time. Permits contain a checklist to be completed prior to commencing “Hot Work” activities and also at the conclusion of the “Hot Work”.

“Hot Work Program” means a permitted program, carried out by approved facilities-designated personnel, allowing them to oversee and issue permits for “Hot Work” conducted by their personnel or at their facility. The intent is to have trained, on-site responsible personnel ensure that required “Hot Work” safety measures are taken to prevent fires and fire spread.

“Fire Watch” means a trained individual stationed in the “Hot Work” area who monitors the work area for the beginnings of potential, unwanted fires both during and after “Hot

Work". Individuals must be trained and familiar with the operation of portable fire extinguishers and methods to activate building fire alarm systems.

"Responsible Person" means a person trained in the safety and fire safety considerations concerned with "Hot Work". Responsible for reviewing the sites prior to issuing permits as part of the "Hot Work" permit program and following up as the job progresses.

4. Responsibilities

NYUWH Director of Engineering will:

- a. Develop written "Hot Work" Program and revise the Program as necessary
- b. Provide "Hot Work" procedure training for supervisors and employees who perform "Hot Work" operations
- c. Obtain a "Hot Work" Operational Permit from the local Fire Marshall as needed
- d. Act as the Responsible Person for "Hot Work" events
- e. Periodically audit operations, documentation and training

NYUWH Engineering personnel will:

- a. Be thoroughly familiar with the NYUWH "Hot Work" Program procedures
- b. Follow all "Hot Work" procedures
- c. Complete "Hot Work" Permits
- d. Participate in "Hot Work" and portable fire extinguisher training when scheduled
- e. Comply with all other safety regulations in effect (ie. Confined Space, Lockout-Tagout)

Fire Watch personnel will:

- a. Be aware of the inherent hazards of the work site
- b. Ensure safe conditions are maintained during the "Hot Work" operation
- c. Have the authority to stop the "Hot Work" operations if unsafe conditions develop
- d. Have fire extinguishing equipment immediately available and be trained on the use and operation.
- e. Call 911 immediately and activate emergency response in the event of a fire

Outside Contractors are responsible for:

- a. Having "Hot Work" safety procedures as a part of their project safety programs.
- b. Provide NYUWH Director of Engineering or his designee with a copy of the contractor's "Hot Work" Permit

5. Specific Procedures

- a. "Hot Work" should not be performed if the work can be avoided or performed in a safer manner. When practical, objects to be welded, cut or heated should be moved to a designated safe location, (i.e. maintenance shop).
- b. Before "Hot Work" is permitted and at least once per day while the "Hot Work" permit is in effect, the "Hot Work" area shall be inspected by the NYUWH Engineering Manager overseeing the work to ensure that it is a fire safe area.

The pre-“Hot Work” checklist must be completed by the welder. Information shown on the “Hot Work” permit must be verified by the Engineering Manager prior to signing the “Hot Work” permit. If the Engineering Manager is known to be off-campus on the day that “Hot Work” will be performed, then the Engineering Manager designee may perform the pre-“Hot Work” inspection and complete the checklist.

- c. The environment where “Hot Work” will be performed must be conducive to “Hot Work”. All other safety precautions apply when performing “Hot Work” (ie. Confined Space, Lockout-Tagout, etc.)
- d. All precautions on the NYUWH “Hot Work” Permit must be met prior to any work commencing. The NYUWH Engineering Manager will complete the pre-“Hot Work” checklist.
- e. The NYUWH “Hot Work” Permit is only good for the date specified on the permit.
- f. An NYUWH “Hot Work” Permit must be displayed at the work site during all “Hot
- g. Work” activities.
- h. All building occupants must be suitably protected against hazards generated by the work. (i.e. heat, sparks, fumes, welding rays, etc).

6. Before “Hot Work” begins:

- a. An appropriate fire extinguisher must be available and operable. A dedicated fire extinguisher will be for “Hot Work” use. This extinguisher will be in addition to any other fire extinguishers in the work area. During “Hot Work”, the fire extinguisher must be readily accessible within 30 feet of the location where “Hot Work” is performed.
- b. Flammable and ignitable materials and debris must be moved at least 35 feet from the “Hot Work” area or covered and protected from the “Hot Work” by fire resistant material. Removing all flammable and ignitable materials and debris is preferred.
- c. Explosives, compressed gas cylinders or stored fuel must be moved at least 50 feet from the “Hot Work” area or covered and protected from the “Hot Work” by fire resistant material. Removing all explosives, compressed gas cylinders or stored fuel is preferred.
- d. Smoke and fire detectors in the immediate area of the “Hot Work” must be temporarily disabled until the “Hot Work” is completed.
- f. Automatic sprinkler protection may not be shut off while “Hot Work” is performed. Where “Hot Work” is performed close to automatic sprinklers, noncombustible barriers or damp cloth guards shall shield the individual sprinkler heads and shall be removed when the work is completed. If the work extends over several days, the shields shall be removed at the end of each workday.
- g. Adequate ventilation must be used (especially when cutting or welding materials with painted or metal coated surfaces).
- h. Building occupants must be protected or isolated from the “Hot Work” area.

- i. Cracks or holes in floors, walls, and ceilings (including ductwork) must be properly covered or plugged to prevent the passage of sparks to combustible areas.
- j. "Hot Work" equipment is operable and in good repair.
- k. Partitions segregating the "Hot Work" areas from other areas of the building shall be non-combustible. In fixed "Hot Work" areas, the partitions shall be securely connected to the floor so that no gap exists between the floor and the partition. Partitions must prevent the passage of sparks, slag, and heat from the "Hot Work" area.
- l. Any drums, barrels and/or tanks shall be cleaned and purged of flammable and toxic liquids, vapors and solids; all tank feeds shall be closed, and the tank vented.
- m. A conspicuous hazard identification sign must be posted in a visible location to warn others before they enter the "Hot Work" area.
The sign shall have the following warning:

CAUTION!
HOT WORK IN PROGRESS
STAY CLEAR

Fire Watch, the Fire Watch shall be in effect during the "Hot Work" operations and for at least **30** minutes after "Hot Work" is complete.

When "Hot Work" is complete:

- a. The work area and any potentially affected surrounding areas shall be inspected for fire, fire damage or the potential for fire for a minimum of **30** minutes following completion of the "Hot Work".
- b. Smoke / fire alarms that were disabled because of "Hot Work" shall be reactivated.
- c. The "Hot Work" permit will be closed out
- d. The completed "Hot Work" Permit is to be returned directly to the NYUWH Engineering Manager.

7. Gas Cylinders

- a. Devices or attachments mixing air or oxygen with combustible gases prior to consumption, except at the burner or in a standard torch shall not be allowed unless approved.
- b. Storage, handling, and use of compressed gas cylinders, containers, and tanks will be in accordance with the NYUWH Compressed Gas Cylinder policy.
- c. Cylinders, valves, regulators, hoses, and other apparatus and fittings for oxygen shall be kept free from oil or grease. Oxygen cylinders, apparatus and fittings shall not be handled with oily hands, oily gloves, or greasy tools or equipment.

- d. The torch valve shall be closed and the gas supply to the torch completely shut off when gas welding or cutting operations are discontinued for a period of one (1) hour or more.

8. Prohibitions

“Hot Work” operations are not permitted:

- a. In sprinklered buildings while such protection is impaired unless permission is granted by the local Fire Marshall prior to the start of any “Hot Work”
- b. In the presence of explosive atmospheres, or in situations where explosive atmospheres may develop inside contaminated or improperly prepared tanks or equipment which previously contained flammable liquids
- c. In areas where there exists the potential for an explosive atmosphere, such as locations where flammable gases, liquids, or vapors are present
- d. In areas with an accumulation of combustible debris, dust, lint and oily deposits
- e. In areas near the storage of exposed, readily ignitable materials such as combustibles (ie. baled paper, dust, loose combustibles)
- f. In a confined space, until the confined space has been inspected and determined to be safe.

9. Employee Training

Training must be conducted:

- a. For NYUWH employees assigned to perform “Hot Work” operations
- b. Whenever periodic audits reveal deviations from this program are occurring

10. Recordkeeping

- a. The NYUWH Director of Engineering will maintain records of all training documentation for all NYUWH personnel authorized to perform “Hot Work” operations.
- b. The NYUWH Director of Engineering will maintain copies of all completed “Hot Work” Permits.

11. Outside Contractors

Outside contractors performing “Hot Work” on the NYUWH campus are required to have “Hot Work” safety procedures as a part of their project safety programs. Contractors must forward a copy of their “Hot Work” program to the NYUWH Director of Engineering prior to performing any “Hot Work” operations.

12. NYUWH Hot Work Permit

See attached.

**NYU WINTHROP HOSPITAL
ENGINEERING DEPARTMENT**



HOT WORK PERMIT

HW Permit No: _____

Date Issued: _____

Project Title/Project Number: _____

Permit Issued to: _____

Project Location: _____

**ALL COMBUSTIBLE MATERIALS ARE TO BE REMOVED
FROM THE WORK AREA AND ITS PERIMETER**

1. Type of Work Performed:

- WELDING TORCH CUTTING SOLDERING OTHER

Description: _____

2. Work Area(s) Affected:

3. Fire Watch Equipped With:

4. Fire Alarm Shutdown Required

Electrical Shop Notified

PERMIT EXPIRES AT END OF WORK DAY ON DATE INDICATED ABOVE

Prepared by: _____

cc: Safety Project Manager _____

Engineering Electrical Shop _____