



## **ABC Midwest Solutions, LLC – 2022 - Occupational Health and Safety Manual**

*We are pleased to present to the public our copy of our 2022 Safety Manual.*

*Please feel free to download adopt all concepts to your Safety Manual as you see fit; however, when you discover areas where we could improve our statements and / or program, all we ask is that you alert us to those items so we can address them accordingly and note that all of our field personnel have completed their OSHA 30 training and this document is a supplement to their certificates for their benefit.*

*Thank you and may you and your family stay safe.*

*Send your comments and questions to*

[theboss@abcmws.com](mailto:theboss@abcmws.com)

### **Table of contents**

1. General Safety Policy and Procedures
2. Bloodborne Pathogen Exposure Control Plan
3. Confined Spaces Program
4. Electrical Safety
5. Fall Protection Procedures
6. Grounds: Power Lawnmowers
7. Chemical Hazard Communication Program
8. Hearing Conservation Program
9. Lockout / Tagout Program
10. Office Safety Procedures
11. Personal Protection Program (PPE)
12. Powered Industrial Trucks
13. Respiratory Protection Program
14. Scaffold Safety
15. Thermal Stress
16. Tools, Equipment and Construction Safety
17. Vehicle and Golf Cart Safety
18. Welding and Cutting
19. ABC MIDWEST SOLUTIONS, LLC Hazardous Waste Management Plan
20. GHS Written Training Program



# 1. General Safety Policy and Procedures

## 1.0 Introduction

The first consideration of the safety program at ABC Midwest Solutions, LLC is the well-being of its students, faculty, and staff. ABC MIDWEST SOLUTIONS, LLC has an obligation to prevent injuries and suffering to persons and their families as well as a legal responsibility to keep the environment safe for all.

In addition to humanitarian reasons, there are also economic and efficiency reasons for a safety program. Whenever an accident occurs, operating efficiency is adversely affected. In addition to the lost time of the employee, there may be lost time of fellow employees, replacement and/or repair of damaged property, time spent reporting and investigating accidents, training of substitute employees, and a lowered morale to be considered. To this end ABC MIDWEST SOLUTIONS, LLC has developed and maintains an occupational health, safety & accident prevention program designed to reduce and minimize injury and occupational illness.

## 2.0 Responsibility

Safety is everyone's business. All individuals who work at ABC Midwest Solutions, LLC are responsible for their own safety and for the safety of those with whom they may come into contact. The safety responsibility of persons in administrative and supervisory positions is directly proportional to their operational authority.

### 1. 2.1 Manager Responsibilities (Officer, Dean or Director)

Managers are responsible for ensuring that:

- Individuals under their management have the authority to implement appropriate health and safety policies, practices and programs.
- Funding for health and safety programs, practices, and equipment is requested, secured and appropriated as needed.
- Areas under their management follow ABC MIDWEST SOLUTIONS, LLC health and safety practices, policies and programs.
- Activities under their management that pose a risk to the health & safety of our community be discontinued until they can meet regulatory and ABC MIDWEST SOLUTIONS, LLC expectations for a safe and healthy work and learning environment.



## ABC Midwest Solutions 2022 Safety Program

### 2. 2.2 Supervisor Responsibilities (Those who provide guidance to other employees.)

Supervisors are responsible for the implementation of ABC MIDWEST SOLUTIONS, LLC's Occupational Safety, Health & Accident Prevention Program. This includes:

- Ensuring that workplaces and equipment are safe, well maintained and in compliance with external agency regulations and ABC MIDWEST SOLUTIONS, LLC policies, programs and practices.
- Ensuring that health and safety practices and procedures are clearly communicated and understood by employees through training.
- Enforcing health and safety rules related to job performance fairly and uniformly.
- Evaluating employees on compliance with safe work practices.
- Encouraging employees and students to report workplace hazards without fear of reprisal.
- Ensuring that inspections, investigations and health and safety training records are kept for the designated period of time as specified in each code requirement, which may be many years after an employee leaves ABC MIDWEST SOLUTIONS, LLC.

### 3. 2.3 Employee and Student Responsibilities

Employees and students are responsible for following the requirements of the ABC MIDWEST SOLUTIONS, LLC Occupational Safety, Health & Accident Prevention Program. This includes:

- Actively supporting and participating in ABC MIDWEST SOLUTIONS, LLC efforts to provide a safe working environment.
- Coordinating and cooperating with all other employees in the workplace to try to eliminate on-the-job injuries and illnesses.
- Applying the principles of accident prevention in daily work, class, laboratory, residence, or jobsite and use proper safety devices and protective equipment required by ABC MIDWEST SOLUTIONS, LLC.
- Taking care of all personal protective equipment properly.
- Not wearing torn or loose clothing while working around machinery.



#### ABC Midwest Solutions 2022 Safety Program

- Reporting promptly to your supervisor every injury or occupational illness.
- Not removing, displacing, damaging, destroying or carrying off any safeguard, notice, or warning provided to make the workplace safe.
- Not interfering with the use of any work practice designed to protect you from injuries.
- Doing everything reasonably necessary to protect the life and safety of others.
- Participating in training programs.

#### 4. 2.4 Environmental Health & Safety Manager Responsibilities

The Environmental Health & Safety Manager (Christopher Braun) is responsible for the development and administration of the Occupational Safety, Health, & Accident Prevention Program. This involves:

- Assisting supervisors in conducting workplace hazard assessments to identify, evaluate, and correct hazards.
- Providing training and technical assistance to managers and supervisors on implementation of the program.
- Reviewing, updating and evaluating the overall effectiveness of the program.
- Evaluating the adequacy and consistency of training designed by schools and departments.

### 3.0 ABC MIDWEST SOLUTIONS, LLC SAFETY COMMITTEE PLAN (WAC 296-800-130)

The Safety Committee is composed of appointed members and members elected to one-year terms from all areas of ABC MIDWEST SOLUTIONS, LLC, including staff, administration, faculty, and students. The number of appointed members shall not exceed the number of elected members. The Committee annually elects a chairperson from its membership. Its services are available to all ABC MIDWEST SOLUTIONS, LLC faculty, staff, and students. Contact can be made with the committee's chairperson or any of the committee members to report safety concerns or violations.

The role of the Safety Committee is to:

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## ABC Midwest Solutions 2022 Safety Program

- Meet regularly and include discussion of established safety topics, such as accident and illness prevention methods, safety and health promotion, hazards noted on inspections, and occupational injury and illness records.
- Make sure that safety committee meeting minutes are recorded and preserved.
- Advise the Environmental Health & Safety Manager and the President's Council on the adequacy of ABC MIDWEST SOLUTIONS, LLC health and safety programs, policies, and organization.
- Recommend priorities and strategies to promote good health and safety on campus.
- Foster coordination among those units at ABC MIDWEST SOLUTIONS, LLC having operational responsibility for health and safety.
- Review and recommend to the President's Council company-wide safety and health policies that have not yet been addressed.

Recommendations received by the Committee are accepted, modified, or rejected by the Committee and plans are made to take appropriate action. Minutes of the Committee's meetings are distributed to the members of the Safety Committee and are posted on the Safety Bulletin Boards. Copies are kept on file in the Environmental Health & Safety Manager's office.

### 4.0 Resources

The Environmental Health & Safety Manager is a good resource for safety training requirements and materials, regulatory codes referenced in this document, and assistance in applying the requirements of this program. Workplace Safety & Information, Risk Management, and Human Resources are also good resources on campus safety information.

#### 1. 4.1 Location of the Safety Program

Copies of the ABC Midwest Solutions, LLC Occupational Health, Safety & Accident Prevention Program Manual are in the home office of the ABC MIDWEST SOLUTIONS, LLC Environmental Health & Safety Manager, Human Resources office, and all Departmental offices. Copies of applicable safety program sections will be available in each department or division. It will also be published on the safety web site ([www.ABC Midwest Solutions - safety page](http://www.ABCMidwestSolutions.com/safety)). Employee familiarity with the contents and participation by means of offering suggestions for improving work place safety is welcome and vital to an effective program.

### 5.0 Communications



## ABC Midwest Solutions 2022 Safety Program

### 1. 5.1 Safety & Health Orientation and Training

Orientation should begin the first day of employment on the new job for all new employees, re-hires, part-time employees, and those transferred from another department within ABC MIDWEST SOLUTIONS, LLC. The supervisor will instruct the employee in safety and health requirements specific to the job and identify hazards or hazardous conditions in the work environment. Training in the use of personal protective equipment required for these conditions will be provided or arranged by the supervisor and documented before the employee is required to use the equipment'. Specific training will be provided for certain jobs and kinds of equipment as required by state or federal regulations. ABC MIDWEST SOLUTIONS, LLC has adopted specific training programs for certain hazards including, but not limited to: Chemical Hazard Communication, Laboratory Chemical Hygiene, and Bloodborne Pathogens. The supervisor or the Environmental Health & Safety Manager will document such training. The Human Resources Office will introduce ABC MIDWEST SOLUTIONS, LLC policies and rules including a general briefing of the safety program. On-going safety and health education programs will be available for all employees in an effort to increase awareness of accident causes, to improve team spirit, and to promote acceptance of safety and health rules. First Aid/CPR training and certification will be provided and is encouraged for supervisors, emergency building coordinators, individuals in Facilities Management, and Dining Services.

### 5.2 Safety Meetings

ABC Midwest Solutions, LLC employees in environments with moderate or greater risk of injury (as requested by the Safety Committee) will attend a monthly or weekly supervisor/employee safety meeting. The following are the main safety topics that will be covered, as needed, in the meetings:

- Safety topics of immediate employee interest.
- A review of any safety inspections conducted since the last safety meeting
- A review of any citations, to assist in the correction of hazards
- An evaluation of any safety concerns submitted since the last meeting to determine if the cause of the unsafe acts or conditions has been identified and corrected.
- Other general safety or safety training topics as needed.
- A review of injuries and contributing factors since the last meeting.



## ABC Midwest Solutions 2022 Safety Program

Additional unscheduled safety briefings may be called at any time when a situation warrants an immediate sharing of safety information.

### 5.3 Safety Bulletin Boards

To increase employee safety and health awareness, bulletin boards for safety information are located in several buildings on campus. The Safety Bulletin Boards in the following areas will display all required safety posters and emergency information.

- Fleet services
- Facilities Management co-ordinate

Safety Bulletin Boards in other areas will display safety posters, emergency numbers, MSDS locations, Safety Committee information and other items as determined by the Safety Committee representative for that building.

### 6.0 Accident Prevention

ABC Midwest Solutions, LLC actively seeks to identify hazards in the workplace before injuries occur. ABC MIDWEST SOLUTIONS, LLC believes the best way to minimize these physical hazards is through systematic accident prevention activities including departmental/building self-inspections, inspection team surveys, and employee reporting of hazards.

It is every department's responsibility to conduct a routine self-inspection. An inspection checklist suitable for the area must be utilized. The Environmental Health & Safety Manager can provide a checklist. Any physical hazards, unsafe practices, or problem areas must be reported immediately to the supervisor or director of the department for action. Unresolved problems resulting from the inspection will be forwarded to the Environmental Health & Safety Manager and Safety Committee for review and recommendation.

An inspection team of Safety Committee members will be appointed annually by the Chairperson to assist with safety inspections of ABC MIDWEST SOLUTIONS, LLC facilities. Their surveys will be presented to the Safety Committee for review and further recommendation to the department supervisors. Any department/building may request that the Inspection Team perform an inspection of its facilities. Findings from these inspections will be provided to the Safety Committee.

Please report physical hazards to Facilities Management in the form of a work order request. Requests may be made online ([www.ABC Midwest Solutions, LLC – SAFETY PAGE](http://www.ABCMidwestSolutions.com)) or by telephoning the Facilities Management office at the home office.



## ABC Midwest Solutions 2022 Safety Program

Some physical hazards require significant labor or financial investments to correct. Please work with your supervisor and budget head to submit a capital project or equipment request to your Vice President for approval and allocation of funding for projects.

Report other hazards, such as improperly functioning equipment, unsafe co-workers, and inadequate procedures, to your supervisor.

Any employee who has a ABC MIDWEST SOLUTIONS, LLC or departmental safety concern is encouraged to initiate a **Safety Hazard Reporting Form by calling the home office**. These forms are available from the departments, the Safety Chairperson or the Environmental Health & Safety Manager. The website in the future. The employee will describe the nature and location of the unsafe condition or hazard and may suggest possible corrective action. The reporting form is to be signed by the employee's supervisor and forwarded to the Environmental Health & Safety Manager. An action team of the Safety Committee and/or the Environmental Health & Safety Manager will investigate the hazard and submit a written response to the supervisor and the employee recommending further action.

### **7.0 Incident Reporting and Investigation**

All persons with supervisory responsibility whether faculty, administration, staff, or students, have the duty and responsibility to see that all persons under their charge receive proper emergency medical attention and that a report of any accident is promptly completed and filed with the Human Resource office.

Employees must report all work-related injuries, illness, and/or property damage to the supervisor (regardless of the severity). The supervisor is responsible for investigating the accident and evaluating hazards with the objective of finding the root cause of the incident. Regardless if medical treatment is necessary, the employee and the supervisor must fill out an ABC MIDWEST SOLUTIONS, LLC accident report as soon as possible. Accident report forms are available from the Human Resource Office, the Environmental Health & Safety Office, and the Human Resource and Safety web sites. Copies of each accident report will be forwarded to the Environmental Health & Safety Manager and the Safety Committee for confidential review.

#### **1. 7.1 Investigating Serious Accidents**

An investigation of the cause of any incident that results in serious injuries will be conducted as soon as possible after the emergency actions are completed. The investigation will be conducted by the Environmental Health & Safety Manager, the immediate supervisor of the injured employee, witnesses, and any other person with the special expertise required to evaluate the facts relating to the cause of the incident. The findings of the investigation will be reviewed by the Safety Committee and used as the basis for recommending safety improvements. Steps must be





## ABC Midwest Solutions 2022 Safety Program

taken to maintain the confidentiality of personal information determined to be inappropriate for public release.

2. Any accident that results in a fatality or multiple hospitalizations must be reported immediately to the Environmental Health & Safety Manager who will notify the Department of Labor and Industries within 8 hours. Equipment involved in such an accident will not be moved, except as is necessary to safely remove the victim and protect others, until the incident scene has been examined or released by a representative of the Department of Labor and Industries.

### 7.2 Record Keeping and Posting

ABC Midwest Solutions, LLC maintains a record of occupational injuries and illness. Each recordable injury or illness must be entered on the OSHA 300 Log and 301 Incident Report within seven calendar days of receiving information that a recordable injury or illness has occurred.

A work related injury or illness must be recorded if it results in:

- Death
- Days away from work
- Restricted work or transfer to another job
- Medical treatment beyond first aid
- Loss of consciousness
- Diagnosis of a significant injury/illness by a physician or other licensed health care professional, such as work-related cases involving cancer, chronic irreversible disease, a fractured or cracked bone, or a punctured eardrum
- Every industrial illness.

The Environmental Health & Safety Manager will complete a summary of injuries on an OSHA 300-A form, using figures taken from the OSHA 300 log. The summary for the previous year will be posted on the safety bulletin boards from February 1 until April 30. Any employee can view the current OSHA 300-A summary upon request at any time during the year. The posted annual summary must not be altered, defaced or covered by other material.

## 8.0 First Aid and Automatic External Defibrillators



## ABC Midwest Solutions 2022 Safety Program

All Safety & Information Officers are First Aid and CPR trained. A complete mobile First Aid kit is located at the Campus Safety and Information Office for response anywhere on campus.

First Aid kits are available in all buildings on campus. Automatic External Defibrillators (AEDs) are in the process of being ordered. The locations of first aid kits and AEDs will be published in the Emergency Procedures Manual and posted on the safety website.

Emergency Building Coordinators are responsible for maintaining a full supply of materials in the kits by calling the Environmental Health & Safety Manager for replacements. Campus Safety is responsible for checking the AED batteries on a monthly basis.

ABC MIDWEST SOLUTIONS, LLC makes available First Aid/CPR/AED training and certification for individuals in all areas of ABC MIDWEST SOLUTIONS, LLC. Contact the Environmental Health & Safety Manager for class times.

ABC MIDWEST SOLUTIONS, LLC Safety will be responsible for inspecting each public access AED unit to make sure that it is fully charged and that all of the equipment is present and in working order. Departments who own their own AEDs will be responsible for the inspection and maintenance of those units. The pads will be replaced after every use.

### 1. 8.1 First Aid General Guidelines

The purpose of first aid is to administer lifesaving techniques when necessary and to provide employees with treatment for very minor injuries. The decision to send an employee for medical treatment lies with the immediate supervisor and the employee. Employees must be allowed to seek medical treatment if they believe it is necessary. If the supervisor believes medical treatment is necessary, the employee should comply.

2. An injury **form** must be completed and submitted to Human Resources as soon as possible after an injury-causing incident has occurred. The Safety Committee will review the circumstances surrounding the injury and make recommendations to reduce the risk of future injuries. The university will not provide illness remedies to employees.

### 8.2 Emergency Eyewash Units

Where the eyes or body of any person may be exposed to injurious chemicals and/or materials, suitable facilities for quick drenching or flushing of the eyes and body must be provided, within the work area, for immediate emergency use.



## ABC Midwest Solutions 2022 Safety Program

Eyewash stations shall be inspected annually by Facilities Management and flushed weekly by the occupant to ensure that they will function in an emergency.

### 8.3 Contact Emergency Medical Services or a Physician

The person giving first aid must:

- Avoid panic.
- Direct someone specifically by name to call **the boss** to request emergency assistance.
- Do only those things necessary to sustain life and minimize injury until professional help arrives.
- Look for an emergency medical identification signal device and/or a card to learn about the victim's needs or necessary precautions.

## 9.0 Emergency Procedures and Policies

Specific procedures for all emergency situations are outlined in ABC MIDWEST SOLUTIONS, LLC's Emergency Procedures Handbook. This handbook is given to all employees. Employees are expected to be familiar with these emergency responses procedures.

ABC MIDWEST SOLUTIONS, LLC also has an Emergency Response Plan that details the organization, responsible parties, response priorities, and recovery activities. This plan is issued to each of the departments with emergency responsibilities.

### 1. 9.1 Emergency Aid

ABC Midwest Solutions, LLC has an emergency medical response system composed of qualified Safety Officers in Campus Safety & Information, a company-wide emergency number, direct radio contact from Campus Safety & Information to Dane County emergency services and First Aid trained personnel in most buildings. The EMS is a coordinated means of responding to any accident or sudden illness on campus. In the event of any medical emergency or accident, a bystander must call 911. A ABC MIDWEST SOLUTIONS, LLC Safety & Information Officer will respond immediately, assess the situation, and call for emergency medical assistance from 911 Fire and Rescue as necessary. Bystanders may provide immediate aid to an injured person, such as artificial respiration, CPR, or control of bleeding. Such treatment is considered voluntary emergency assistance until professional emergency medical aid arrives.

## 10.0 Fire Regulations



## ABC Midwest Solutions 2022 Safety Program

ABC Midwest Solutions, LLC will follow all Dane County fire regulations. Questions concerning regulations may be addressed to the Environmental Health & Safety Manager.

### 1. 10.1 Notification and Evacuation

All fires, no matter how small, should be reported at once to ABC MIDWEST SOLUTIONS, LLC even if the fire is handled locally. If a fire occurs in any ABC MIDWEST SOLUTIONS, LLC location or a fire alarm sounds, all occupants of the building must leave the area using the nearest safe departure route. If the alarm has not sounded, activate the pull station as you exit the building. ABC MIDWEST SOLUTIONS, LLC Safety & Information should be notified immediately by calling 911 or in person at ABC MIDWEST SOLUTIONS, LLC office, after evacuating the building.

2. Go to your building emergency assembly point and check in with the emergency building coordinator. No one may re-enter the building until instructed by Fire Department personnel, ABC MIDWEST SOLUTIONS, LLC Safety & Information Officer, or other identified emergency response personnel.

### 10.2 Emergency Exits

3. Emergency exits are to be clearly marked. All emergency exits must be kept clear of obstructions at all times. Panic hardware (push latches on doors) must be kept in operating order. Exit doors cannot be chained shut when people are in an area.

### 4. 10.3 Fire Doors

5. Self-closing fire doors installed for fire protection may not be blocked or wedged in the open position as a personal convenience or to improve ventilation. Fire doors typically open onto main hallways or staircases. Some self-closing doors have devices that hold open the door and release during a fire. These doors may be left open as long as the door is not prevented from closing as it is designed. All personnel should be conscious of this hazard and make a specific effort to ensure these doors remain closed.

### 6. 10.4 Fire Extinguishers:

7. Fire extinguishers are regularly inspected to keep them ready for emergency use. Facilities Management should be called if any extinguisher or fire hose is either used for a fire or discharged maliciously so it can be recharged or replaced. Only persons who have been trained in the use of fire extinguishers are expected to use the extinguishers during an emergency. ABC MIDWEST SOLUTIONS, LLC provides training for all interested employees. All untrained individuals should evacuate the area immediately and call **911** for fire response.



## **11.0 Hazardous Materials**

If a flammable or noxious gas is present in an emergency, the area must be evacuated. Do not attempt to open windows. ABC MIDWEST SOLUTIONS, LLC Safety & Information should be notified from a phone outside the affected area.

If a hazardous material is a contributing factor in an emergency, information on the substance will be available on the material safety data sheet (MSDS). The MSDS may be obtained from the Environmental Health & Safety Manager's office, from the department that "owns" the material, or they can often be found on the manufacturer's website. Contact ABC MIDWEST SOLUTIONS, LLC Safety & Information immediately at 911. Relay MSDS emergency treatment procedures for the specific hazardous material to emergency medical, fire, or other personnel as needed.

## **12.0 Corrective Action, Drug and Alcohol Use, Pets in the Workplace, Smoking, and Violence Prevention**

There are other ABC MIDWEST SOLUTIONS, LLC policies, such as Corrective Action, Drug and Alcohol Use, Pets in the Workplace, Smoking, with which employees are expected to comply that are not contained in this manual. Please review the Personnel Manual and Campus Safety & Information web site for other safety policies that may apply to your work or learning environment.



## 2. Bloodborne Pathogen Exposure Control Plan

### **Bloodborne Pathogen Exposure Control Plan**

#### **Introduction**

ABC Midwest Solutions, LLC (ABC MIDWEST SOLUTIONS, LLC) is committed to providing a safe and healthy work environment for our entire staff. In accordance with the Wisconsin Industrial Safety & Health Act (WISHA) Bloodborne Pathogens Standards and Infectious Waste Management of Dane County, ABC MIDWEST SOLUTIONS, LLC has developed the following exposure control plan to eliminate or minimize employee occupational exposure to blood or other potentially infectious materials as detailed in the Bloodborne Pathogens Standard (BBP).

Employees who have occupational exposure to blood or other potentially infectious material (OPIM) must follow the procedures and work practices in this plan.

Employees can review this plan at any time during their work shifts. This Plan as well as the direct link to the Standard is available to all employees, including temporary, part-time, per-diem, and contract workers, and can be found on the ABC MIDWEST SOLUTIONS, LLC website, as part of the larger ABC MIDWEST SOLUTIONS, LLC Occupational Health and Safety Manual.



## 3. Confined Spaces Program

### Confined Spaces Program

#### 1.0 Introduction

The purpose of the confined space program at ABC Midwest Solutions, LLC (ABC MIDWEST SOLUTIONS, LLC) is to establish procedures to ensure that all confined spaces are identified on the campus and that employees are aware of and practice proper procedures for entry into these potentially hazardous spaces. The procedures in this program apply to any space or area at ABC MIDWEST SOLUTIONS, LLC that is of a confined space. A **Confined space** means a space that 1) is large enough and so configured that an employee can bodily enter and perform assigned work; 2) has limited or restricted means for entry or exit, and 3) is not designed for continuous employee occupancy. These spaces may include, but are not limited to, utility vaults, tunnels, attics, boilers, vessels, ducts, tanks, sewers, pipelines, silos, storage bins, hoppers and pits. See Appendix 4-A for a list of identified ABC MIDWEST SOLUTIONS, LLC confined spaces.

#### 2.0 Policy

ABC Midwest Solutions, LLC employees will be trained to enter permit-required spaces that can be reclassified to enable the use of alternate entry procedures. Employees are not currently trained, nor are their effective procedures or equipment in place, to permit entry into confined spaces that require full permit procedures to be used.

All employees will be made aware of the provisions of this program as those provisions apply to the employee's respective role. The types of employees covered by this program include, but are not limited to maintenance employees, TV/radio and telecommunications technicians and supervisors.

##### 1. 2.1 Compliance

All employees are required to comply with this program. Because of the potentially deadly nature of hazards in confined spaces, strict disciplinary procedures will be followed for employees violating these rules. Please refer to the corrective action policy in the personnel manual.

#### 3.0 Responsibilities

##### 1. 3.1 Environmental, Health, Safety & Emergency Programs Director Responsibilities



## ABC Midwest Solutions 2022 Safety Program

The University Environmental, Health, Safety and Emergency Programs Director is responsible for ensuring that employee training and retraining programs on this procedure are available for all affected employees.

### 3.2 Supervisor Responsibilities

- - The supervisor is responsible for ensuring that affected employees get trained by working with the ABC MIDWEST SOLUTIONS, LLC's Environmental, Health, Safety and Emergency Programs Director.
  - Each supervisor will assure that the testing and safety equipment required for compliance with the procedures are accessible to all affected employees as needed.
  - Each supervisor of affected employees is responsible for effectively enforcing compliance with these confined space procedures in their department. This includes the use of corrective disciplinary action when necessary for violations of procedures.

### 3.3 Employee Responsibilities

- - All affected employees are expected to comply with the confined spaces procedures in this program.
  - All affected employees are expected to use the testing and safety equipment required by the procedures and provided by the university.
  - Employees should consult with their supervisor or the Environmental, Health, Safety and Emergency Programs Director whenever there are any questions regarding their personal protection during maintenance, service, or routine operations in confined spaces.
  - Employees should report new data, problems, or changes to a confined space to the Environmental, Health, Safety and Emergency Programs Director and their supervisor.

### 3.4 Entrant Duties

- Know the hazards that may be faced during entry.





## ABC Midwest Solutions 2022 Safety Program

- Know how to properly use the safety and monitoring equipment required for the job.
- Exit from the space immediately when the entrant detects signs and symptoms of exposure, a prohibited condition, or an evacuation alarm is activated.
- Arrange for a buddy to check on you periodically when using alternate entry procedures.

### 4.0 Training Requirements

All employees who must enter confined spaces will be trained in this program before the employee is assigned confined space responsibilities. It is the supervisor's responsibility to arrange training for the employee. The Environmental, Health, Safety and Emergency Programs Director may be of assistance.

Training records containing the employee's name, date of training, signature of trainers, and identity of trainer must be retained by the supervisor and submitted to the Environmental, Health, Safety and Emergency Programs Director.

#### 1. 4.1 Initial Training

Employee training will include

- - Identification and location of known permit required confined spaces on campus.
  - Identification of known or potential hazards in confined spaces.
  - Use of testing procedures for confined spaces.
  - Use of testing equipment.
  - Introduction of entry procedures and forms.

#### 4.2 Retraining

Retraining for permit required spaces will be provided bi-annually. Otherwise, training will be provided when there is a change in job assignments, a change in machine, equipment or a process that present a new hazard, a change in entry procedures, or when periodic inspection reveals that there are deviations in employee knowledge of the procedures.

### 5.0 Contractors



## ABC Midwest Solutions 2022 Safety Program

The ABC MIDWEST SOLUTIONS, LLC Project Manager will notify outside contractors, who have employees engaged in activities that may require entry into confined spaces, of ABC MIDWEST SOLUTIONS, LLC's confined spaces policy and procedures. This notification will be provided to the contract in writing

The Project Manager will identify all known confined spaces to the contractor. The contractor will supply his or her own equipment and employee training for confined spaces entry. All contractors must, at minimum, abide by ABC MIDWEST SOLUTIONS, LLC confined spaces procedures as a condition of their contract; failure to comply with these procedures will result in the cancellation of any service contract and expulsion of the contractor from the ABC MIDWEST SOLUTIONS, LLC campus.

Contractors must coordinate entry with all employees who will also be working in the space. Contractors who are entering a ABC Midwest Solutions, LLC space must have the confined space entry permit or alternate entry worksheet signed by authorized employee from the department who maintains the space to acknowledge that ABC MIDWEST SOLUTIONS, LLC know of their entry.

Contractors must report problems or changes to a confined space to the project manager who will convey those changes to the Environmental, Health, Safety and Emergency Programs Director.

### **6.0 Confined Space Procedures**

#### **1. 6.1 Identification of Confined Spaces**

The types of confined spaces on the ABC MIDWEST SOLUTIONS, LLC are listed in Appendix A. This list includes the risks associated with the space and entry procedures required for the space. Signs will be posted at the entrance to the spaces identified in the confined space list.

Evaluation of potential confined spaces on the ABC MIDWEST SOLUTIONS, LLC campus will be done on a continuous basis. As new confined spaces become known or as hazards are eliminated or identified in existing spaces, Appendix A will be adjusted accordingly by the Environmental, Health, Safety and Emergency Programs Director. Employees who are aware of such changes shall notify the Environmental, Health, Safety and Emergency Programs Director.

#### **6.2 Entry Procedures**

Procedures for entry into each type of confined space are listed in Appendix A. These procedures must be followed exactly before entry into confined spaces is allowed.



## ABC Midwest Solutions 2022 Safety Program

Entry will be coordinated among the entrants, if more than one type of activity is occurring at the same time within a single space.

### 6.3 Permit-Required Confined Space Procedures

Permit-required confined space (permit space) means a confined space that has one or more of the following characteristics: 1) contains or has a 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.

A Non-permit confined space means a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Entry into permit-required spaces will require an entry permit

### 6.4 Alternate Entry Procedures

Permit-required confined spaces that have hazards that can be controlled from the outside (i.e. mechanical ventilation) leaving only an actual or potential atmospheric hazard may be entered under alternate entry procedures. Employees may enter the space by reclassifying it at the time of entry using the following procedure. The space is continuously ventilated while the entrant is inside. Entrants must exit the space should any of the gas readings demonstrate an unsafe atmosphere or the space cannot be continuously ventilated.

- Obtain a copy of the Certificate of Temporary Reclassification Worksheet in Appendix B and the Alternate Entry Procedure Worksheet in Appendix C.
- Get the help of another confined space entry trained employee.
- Control hazards by completing lock out tag out procedures from outside the space.
- Identify and control other hazards by using appropriate control methods from outside the space.
  - Cool to ambient temperature
  - Stabilize loose materials or enter when empty
  - Use fall protection harness or guardrail



#### ABC Midwest Solutions 2022 Safety Program

- Use buddy system
- Use ladder
- If hazards cannot be controlled from outside the space, you may not reclassify the space and you may not enter it.
- Fill out and sign the Certificate of Temporary Reclassification Worksheet.
- Document the following activities using the Alternate Entry Procedure Worksheet.
  - Conduct fresh air and bump test on 4-gas monitor.
  - Establish safe conditions for removing the cover of the confined space.
  - Use monitoring equipment to test for oxygen, flammable gases, carbon monoxide and hydrogen sulfide around the cover of the space.
  - Monitor for the above parameters at four-foot depth intervals before removing cover, when possible. Be sure to wait the amount of time for the reading to register correctly on the instrument that you are using.
  - If readings are within acceptable levels, continue entry procedure. If not, abort entry and contact the Environmental, Health, Safety and Emergency Programs Director or a confined space entry trained supervisor to evaluate the cause of the abnormal levels.
- Remove cover. (If you were unable to monitor within the space before removing cover, this is the time to do it.
- Install air ventilation system.
- Install guardrails and toe boards to prevent items and people from falling into space.
- Ensure monitor is still on and attach to your body.
- Enter space and complete work.
- Leave space when conditions change that creates a hazardous environment. Contact the Environmental, Health, Safety and



## ABC Midwest Solutions 2022 Safety Program

Emergency Programs Director or a confined space entry trained supervisor.

- Submit both the Certificate of Temporary Reclassification Worksheet and the Alternate Entry Procedure Worksheet to the Environmental, Health, Safety and Emergency Programs Director after work is complete.
- Relative to the hazards of the confined space, make arrangements to be checked on periodically by another confined space entry trained person while you are in the confined space.

### 6.5 Lockout/Tagout Procedures

All Lockout/Tagout procedures for permit-required spaces will follow ABC MIDWEST SOLUTIONS, LLC's Lockout/Tagout program.

### 6.6 Equipment Use

Ventilation: Blowers may be used to adequately remove any hazardous atmospheres from the permit required spaces. Spaces must be monitored before and during entry and must be within acceptable limits before entry is permitted.

Personal Protective Equipment (PPE): Appropriate personal protective equipment will be used to enter any permit-required space as outlined in the procedures for that space. All PPE must be readily available to the employee and regularly inspected before each use.

### 6.7 Testing and Monitoring Spaces:

Spaces will be monitored for oxygen level, flammable gases, and toxic gases (carbon monoxide and hydrogen sulfide before and during entry.

### 6.8 Emergency Procedures

If someone becomes trapped or disabled in a confined space, call 911 for help from Dane County or Madison Fire and Rescue Technical Response Team.

## 7.0 Review

This program will be updated as new spaces or conditions are identified and procedures developed.



## 4. Electrical Safety

### Electrical Safety

#### 1.0 Purpose

This chapter addresses the electrical safety requirements that are necessary for the practical safeguarding of employees who work with electricity

#### 2.0 General Procedures

##### 1. 2.1 Examination of Equipment

Electrical equipment must be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment is to be determined using the following considerations:

- Suitability for installation and use in conformity with the provisions of this subpart. Suitability of equipment for an identified purpose may be evidenced by listing or labeling for that identified purpose.
- Mechanical strength and durability, including (for parts designed to enclose and protect other equipment) the adequacy of the protection thus provided.
- Electrical insulation.
- Heating effects under conditions of use.
- Arcing effects.
- Classification by type, size, voltage, current capacity, and specific use.
- Other factors that contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

##### 2.2 Installation and Use of Equipment

Listed or labeled equipment must be used or installed in accordance with any instructions included in the listing or labeling.

##### 2.3 Splices

Conductors must be spliced or joined with splicing devices suitable for the use or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices



## ABC Midwest Solutions 2022 Safety Program

must first be spliced or joined to be mechanically and electrically secure without solder and then soldered. All splices and joints and the free ends of conductors must be covered with an insulation equivalent to that of the conductors or with an insulating device suitable for the purpose.

### 2.4 Arcing parts

Parts of electric equipment that in ordinary operation produce arcs, sparks, flames, or molten metal must be enclosed or separated and isolated from all combustible material.

### 2.5 Marking

Electrical equipment may not be used unless the manufacturer's name, trademark, or other descriptive marking, by which the organization responsible for the product may be identified, is placed on the equipment. Other markings must be provided giving voltage, current, wattage, or other ratings as necessary. The marking must be of sufficient durability to withstand the environment involved.

### 2.6 Identification of Disconnecting Means and Circuits

Each disconnecting mean required by this subpart for motors and appliances must be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, must be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings must be of sufficient durability to withstand the environment involved.

### 2.7 Systems of 600 Volts, Nominal, or Less.

Sufficient access and working space must be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.

Except as required or permitted elsewhere in this chapter, the dimension of the working space in the direction of access to live parts operating at 600 volts or less and likely to require examination, adjustment, servicing, or maintenance while live may not be less than indicated in Table 1. In addition, workspace may not be less than 30 inches wide in front of the electric equipment. Distances must be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. Concrete, brick, or tile walls are considered to be grounded. Working space is not required in back of assemblies such as dead-front switchboards or motor control centers where there are no renewable or adjustable parts such as fuses or switches on the back and where all connections are accessible from locations other than the back.



- 2. \_\_\_\_\_
- 3.

Nominal Voltage to Ground	Minimum Clear Distance for Condition** (ft)	
	(a)	(b)
0-150	3*	3*
151-600	3*	3 ½

- 4. *\*Minimum clear distances may be 2 feet 6 inches for installations built prior to effective date of this section. \*\*Conditions (a), (b), (c), are as follows:*

- - *(a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by suitable wood or other insulating material. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts.*
  - *(b) Exposed live parts on one side and grounded parts on the other side*
  - *(c) Exposed live parts on both sides of the workspace (not guarded as provided in condition (a) with the operator between).*

- 5. \_\_\_\_\_

6. Working space required by this subpart may not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, must be suitably guarded. At least one entrance of sufficient area must be provided to give access to the working space around electric equipment. Where there are live parts normally exposed on the front of switchboards or motor control centers, the working space may not be less than three feet. Illumination must be provided for all working spaces around service equipment, switchboards, panel boards, and motor control center installed indoors. The minimum headroom of working spaces around service equipment, switchboards, panel boards, or motor control centers must be 6 feet 3 inches. **Note:** *As used in this section, a motor control center is an assembly of one or more enclosed sections having a common power bus and principally*





*containing motor control units.*

## **2.8 Guarding of Live Parts**

Except as required or permitted elsewhere in this section, live parts of electric equipment operating at 50 volts or more must be guarded against accidental contact by approved cabinets or other forms of approved enclosures, or by any of the following means:

- By location in a room, vault, or similar enclosure that is accessible only to qualified persons.
- By suitable permanent, substantial partitions or screens so arranged that only qualified persons will have access to the space within reach of the live parts. Any openings in such partitions or screens must be sized and located, that persons are not likely to come into accidental contact with live parts or to bring conducting objects into contact with them.
- By location on a suitable balcony, gallery, or platform elevated and arranged to exclude unqualified persons.
- By elevation of 8 feet or more above the floor or other working surface.

In locations where electric equipment would be exposed to physical damage, enclosures or guards must be arranged and of such strength so as to prevent damage.

Entrances to rooms and other guarded locations containing exposed live parts must be marked with conspicuous warning signs forbidding unqualified persons to enter.

## **3.0 Wiring Design and Protection**

### **1. 3.1 Use and Identification of Grounded and Grounding Conductors**

A conductor used as a grounded conductor must be identifiable and distinguishable from all other conductors. A conductor used as an equipment grounding conductor must be identifiable and distinguishable from all other conductors.

No grounded conductor may be attached to any terminal or lead so as to reverse designated polarity.



## ABC Midwest Solutions 2022 Safety Program

A grounding terminal or grounding-type device on a receptacle, cord connector, or attachment ABC Midwest Solutions, LLC may not be used for purposes other than grounding.

### 3.2 Outlet Devices

Outlet devices must have an ampere rating not less than the load to be served.

### 3.3 Outside conductors, 600 volts, nominal, or less.

Sections (a), (b), (c), and (d) of this subsection apply to branch circuit, feeder, and service conductors rated 600 volts, nominal, or less and run outdoors as open conductors. Subdivision (e) of this subsection applies to lamps installed under such conductors.

(a) Conductors supported on poles must provide a horizontal climbing space not less than the following:

- Power conductors below communication conductors: 30 inches.
- Power conductors alone or above communication conductors, 300 volts or less: 24 inches; more than 300 volts: 30 inches.
- Communication conductors below power conductors with power conductors 300 volts or less: 24 inches; more than 300 volts: 30 inches.

(b) Open conductors must conform to the following minimum clearances:

- 10 feet: above finished grade, sidewalks, or from any platform or projection from which they might be reached.
- 12 feet: over areas subject to vehicular traffic other than truck traffic.
- 15 feet: over areas other than those specified in this subsection that are subject to truck traffic.
- 18 feet: over public streets, alleys, roads, and driveways.

(c) Conductors must have a clearance of at least 3 feet from windows, doors, porches, fire escapes, or similar locations. Conductors run above the top level of a window are out of reach from that window and, therefore, do not have to be 3 feet away.



## ABC Midwest Solutions 2022 Safety Program

(d) Conductors must have a clearance of not less than 8 feet from the highest point of roofs over which they pass, except that:

- Where the voltage between conductors is 300 volts or less and the roof has a slope of not less than 4 inches in 12, the clearance from the roofs must be at least 3 feet; or
- Where the voltage between conductors is 300 volts or less and the conductors do not pass over more than 4 feet of the overhang portion of the roof and they are terminated at a through-the-roof raceway or approved support, the clearance from the roofs must be at least 18 inches.

(e) Lamps for outdoor lighting must be located below all live conductors, transformers, or other electric equipment, unless such equipment is controlled by a disconnecting means that can be locked in the open position or unless adequate clearances or other safeguards are provided for re-lamping operations.

### 3.4 Services

Means must be provided to disconnect all conductors in a building or other structure from the service-entrance conductors. The disconnecting means must plainly indicate whether it is in the open or closed position and must be installed at a readily accessible location nearest the point of entrance of the service-entrance conductors.

Each service-disconnecting means must simultaneously disconnect all ungrounded conductors.

The following additional requirements apply to services over 600 volts, nominal.

- Service-entrance conductors installed as open wires must be guarded to make them accessible only to qualified persons.
- Signs warning of high voltage must be posted where people other than qualified employees might encounter live parts.

### 3.5 Overcurrent Protection

The following requirements apply to overcurrent protection of circuits rated 600 volts, nominal, or less.

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#### ABC Midwest Solutions 2022 Safety Program

- Conductors and equipment must be protected from overcurrent in accordance with their ability to safely conduct current.
- Except for motor-running overload protection, overcurrent devices may not interrupt the **continuity** of the grounded conductor unless all conductors of the circuit are opened simultaneously.
- Except for service fuses, all cartridge fuses that are accessible to people who are not qualified and all fuses and thermal cutouts on circuits over 150 volts to ground must be provided with disconnecting **means**. This disconnecting means must be installed so that the fuse or thermal cutout can be disconnected from its supply without disrupting service to equipment and circuits unrelated to those protected by the overcurrent device.
- Overcurrent devices must be readily accessible to each employee or authorized building management personnel. These overcurrent devices may not be located where they will be exposed to physical damage or in the vicinity of easily ignitable material.
- **Fuses** and circuit breakers must be located or shielded so that employees will not be burned or otherwise injured by their operation.
- **Circuit breakers.**
  0. Circuit breakers must clearly indicate whether they are in the open (off) or closed (on) position.
  1. Where circuit breaker **handles** on switchboards are operated vertically rather than horizontally or rotationally, the up position of the handle must be in the closed (on) position.
  2. If used as switches in 120-volt, fluorescent lighting circuits, circuit breakers must be approved for the purpose and marked "SWD."

Feeders and branch circuits over 600 volts, nominal, must have short-circuit protection.

### 3.6 Grounding

The following systems that supply premises wiring must be grounded:

- All three-wire DC systems must have their neutral conductor grounded.



### ABC Midwest Solutions 2022 Safety Program

- Two-wire DC systems operating at over 50 volts but under 300 volts between conductors must be grounded unless one of the following applies:
  0. They supply only industrial equipment in limited areas and are equipped with a ground detector.
  1. They are rectifier-derived from an AC system complying with sections 3, 4, and 5 below; or
  2. They are fire-protective signaling circuits having a maximum current of 0.030 amperes.
- AC circuits of less than 50 volts must be grounded if they are installed as overhead conductors outside of buildings or if they are supplied by transformers and the transformer primary supply system is ungrounded or exceeds 150 volts to ground.
- AC systems of 50 volts to 1000 volts must be grounded under any of the following conditions, unless exempted by item 4 below:
  0. If the system can be grounded so that the maximum voltage to ground on the ungrounded conductors does not exceed 150 volts;
  1. If the system is nominally rated 480Y/277 volt, 3-phase, 4-wire in which the neutral is used as a circuit conductor;
  2. If the system is nominally rated 240/120 volt, 3-phase, 4-wire in which the midpoint of one phase is used as a circuit conductor; or
  3. If a service conductor is un-insulated.
- AC systems of 50 volts to 1000 volts are not required to be grounded when the system is separately derived and is supplied by a transformer that has a primary voltage rating of less than 1000 volts, provided all of the following conditions are met:
  0. The system is used exclusively for control circuits
  1. The conditions of maintenance and supervision assure that only qualified persons will service the installation
  2. Continuity of control power is required
  3. Ground detectors are installed on the control system.



## Conductors to be Grounded

For AC premises wiring systems the identified conductor must be grounded.

### Grounding Connections

For a grounded system, a grounding electrode conductor must be used to connect both the equipment grounding conductor and the grounded circuit conductor to the grounding electrode. Both the equipment grounding conductor and the grounding electrode conductor must be connected to the grounded circuit conductor on the supply side of the service disconnecting means, or on the supply side of the system disconnecting means or overcurrent devices if the system is separately derived.

For an ungrounded service-supplied system, the equipment grounding conductor must be connected to the grounding electrode conductor at the service equipment. For an ungrounded, separately derived system, the equipment grounding conductor must be connected to the grounding electrode conductor at, or ahead of, the system disconnecting means or overcurrent devices.

On extensions of existing branch circuits that do not have an equipment grounding conductor, grounding-type receptacles may be grounded to a grounded cold water pipe near the equipment.

### Grounding Path

The path to ground from circuits, equipment, and enclosures must be permanent and continuous.

### Supports, Enclosures, and Equipment to be Grounded

Metal cable trays, metal raceways, and metal enclosures for conductors must be grounded, except that:

- Metal enclosures such as sleeves that are used to protect cable assemblies from physical damage need not be grounded.
- Metal enclosures for conductors added to existing installations of open wire, knob-and-tube wiring, and nonmetallic-sheathed cable need not be grounded if all of the following conditions are met:
  0. Runs are less than 25 feet
  1. Enclosures are free from probable contact with ground, grounded metal, metal laths, or other conductive materials



## ABC Midwest Solutions 2022 Safety Program

### 2. Enclosures are guarded against employee contact.

Metal enclosures for service equipment must be grounded.

Frames of electric ranges, wall-mounted ovens, counter-mounted cooking units, clothes dryers, and metal outlet or junction boxes that are part of the circuit for these appliances must be grounded.

Exposed noncurrent-carrying metal parts of fixed equipment that may become energized must be grounded under any of the following conditions:

- - If within 8 feet vertically or 5 feet horizontally of ground or grounded metal objects and subject to employee contact.
  - If in a wet or damp location and not isolated.
  - If in electrical contact with metal.
  - If in a hazardous (classified) location.
  - If supplied by a metal-clad, metal-sheathed, or grounded metal raceway wiring method.
  - If equipment operates with any terminal at over 150 volts to the ground; however, the following need not be grounded:
    - 0. Enclosures for switches or circuit breakers used for other than service equipment and accessible to qualified persons only
    - 1. Metal frames of electrically heated appliances which are permanently and effectively insulated from ground
    - 2. The cases of distribution apparatus such as transformers and capacitors mounted on wooden poles at a height exceeding 8 feet above ground or grade level.

Exposed noncurrent-carrying metal parts of cord-connected and ABC Midwest Solutions, LLC connected equipment that may become energized must be grounded in the following circumstances:

- If in hazardous (classified) locations.
- If operated at over 150 volts to ground, except for guarded motors and metal frames of electrically heated appliances if the appliance frames are permanently and effectively insulated from ground.



## ABC Midwest Solutions 2022 Safety Program

- If the equipment is of the following types:
  0. Refrigerators, freezers, and air conditioners
  1. Clothes-washing, clothes-drying and dishwashing machines, sump pumps, and electrical aquarium equipment
  2. Hand-held motor-operated tools
  3. Motor-operated appliances of the following types: Hedge clippers, lawn mowers, snow blowers, and wet scrubbers
  4. Cord-connected and ABC Midwest Solutions, LLC connected appliances used in damp or wet locations or by employees standing on the ground or on metal floors or working inside of metal tanks or boilers
  5. Portable and mobile x-ray and associated equipment
  6. Tools likely to be used in wet and conductive locations
  7. Portable hand lamps. Tools likely to be used in wet and conductive locations need not be grounded if supplied through an isolating transformer with an ungrounded secondary of not over 50 volts. Listed or labeled portable tools and appliances protected by an approved system of double insulation, or its equivalent, need not be grounded. If such a system is employed, the equipment must be distinctively marked to indicate that the tool or appliance utilizes an approved system of double insulation

The metal parts of the following non-electrical equipment must be grounded: Frames and tracks of electrically operated cranes; frames of non-electrically driven elevator cars to which electric conductors are attached; hand operated metal shifting ropes or cables of electric elevators; and metal partitions, grill work, and similar metal enclosures around equipment of over 750 volts between conductors.

### **Methods of grounding fixed equipment**

Non-current-carrying metal parts of fixed equipment, if required to be grounded by this section, must be grounded by an equipment-grounding conductor that is contained within the same raceway, cable, or cord, or that runs with or encloses the circuit conductors. For DC circuits only, the equipment grounding conductor may be run separately from the circuit conductors.





## ABC Midwest Solutions 2022 Safety Program

Electric equipment is effectively grounded if it is secured to, and in electrical contact with, a metal rack or structure that is provided for its support and the metal rack or structure is grounded by the method specified for the non-current-carrying metal parts of fixed equipment. For installations made before May 30, 1982 only, electric equipment is also considered to be effectively grounded if it is secured to, and in metallic contact with, the grounded structural metal frame of a building. Metal car frames supported by metal hoisting cables attached to or running over metal sheaves or drums of grounded elevator machines are also considered to be effectively grounded.

### 4.0 Wiring Methods, Components, and Equipment for General Use

#### 1. 4.1 Wiring methods

The provisions of this section do not apply to the conductors that are an integral part of factory-assembled equipment.

#### General Requirements

Metal raceways, cable armor, and other metal enclosures for conductors must be metallically joined together into a continuous electric conductor and must be so connected to all boxes, fittings, and cabinets as to provide effective electrical continuity.

No wiring systems of any type be installed in ducts used to transport dust, loose stock or flammable vapors. No wiring system of any type may be installed in any duct used for vapor removal or for ventilation of commercial-type cooking equipment, or in any shaft containing only such ducts.

#### Temporary Wiring

Temporary electrical power and lighting wiring methods may be of a class less than would be required for a permanent installation. Except as specifically modified in this paragraph, all other requirements of this subpart for permanent wiring must apply to temporary wiring installations.

Temporary electrical power and lighting installations 600 volts, nominal, or less may be used only:

- During and for **remodeling**, maintenance, repair, or demolition of buildings, structures, or equipment, and similar activities
- For experimental or **development** work



#### ABC Midwest Solutions 2022 Safety Program

- For a period not to **exceed** 90 days for Christmas decorative lighting, carnivals, and similar purposes.

Temporary wiring over 600 volts, nominal, may be used only during periods of tests, experiments, or emergencies.

General requirements for temporary wiring are:

- Feeders must originate in an approved distribution center. The conductors must be run as multiconductor cord or cable assemblies, or, where not subject to physical damage, as open conductors on insulators not more than 10 feet apart.
- Branch circuits must originate in an approved power outlet or panelboard. Conductors must be multiconductor cord or cable assemblies or open conductors. If run as open conductors they must be fastened at ceiling height every 10 feet. No branch-circuit conductor may be laid on the floor. Each branch circuit that supplies receptacles or fixed equipment must contain a separate equipment grounding conductor if run as open conductors.
- Receptacles must be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit must contain a separate equipment grounding conductor and all receptacles must be electrically connected to the grounding conductor.
- No bare conductors or earth returns may be used for the wiring of any temporary circuit.
- Suitable disconnecting switches or ABC Midwest Solutions, LLC connectors must be installed to permit disconnection of all ungrounded conductors of each temporary circuit.
- Lamps for general illumination must be protected from accidental contact or breakage. Protection must be provided by elevation of at least 7 feet from normal working surface or by a suitable fixture or lamp holder with a guard.
- Flexible cords and cables must be protected from accidental damage. Sharp corners and projections must be avoided. Where passing through doorways or other pinch points, flexible cords and cables must be provided with protection to avoid damage.



## Cable trays

Only the following may be installed in cable tray systems:

- Mineral-insulated metal-sheathed cable (Type MI)
- Armored cable (Type AC)
- Metal-clad cable (Type MC)
- Power-limited tray cable (Type PLTC)
- Nonmetallic-sheathed cable (Type NM or NMC)
- Shielded nonmetallic-sheathed cable (Type SNM)
- Multiconductor service-entrance cable (Type SE or USE)
- Multiconductor underground feeder and branch-circuit cable (Type UF)
- Power and control tray cable (Type TC)
- Other factory-assembled, multiconductor control, signal, or power cables which are specifically approved for installation in cable trays or
- Any approved conduit or raceway with its contained conductors.

In industrial establishments only, where conditions of maintenance and supervision assure that only qualified persons will service the installed cable tray system, the following cables may also be installed in ladder, ventilated trough, or 4-inch ventilated channel-type cable trays:

- - Single conductor cables that are 250 MCM or larger and are Types RHH, RHW, MV, USE, or THW, and other 250 MCM or larger single conductor cables if specifically approved for installation in cable trays. Where exposed to direct rays of the sun, cables must be sunlight-resistant.

Cable trays in hazardous (classified) locations must contain only the cable types permitted in such locations.



Cable tray systems may not be used in hoist ways or where subjected to severe physical damage.

### **Open Wiring on Insulators**

Open wiring on insulators is only permitted on systems of 600 volts, nominal, or less for industrial or agricultural establishments and for services.

Conductors must be rigidly supported on noncombustible, nonabsorbent insulating materials and may not contact any other objects.

In dry locations where not exposed to severe physical damage, conductors may be separately enclosed in flexible nonmetallic tubing. The tubing must be in continuous lengths not exceeding 15 feet and secured to the surface by straps at intervals not exceeding 4 feet 6 inches.

Open conductors must be separated from contact with walls, floors, and wood cross members, or partitions through which they pass by tubes or bushings of noncombustible, nonabsorbent insulating material. If the bushing is shorter than the hole, a waterproof sleeve of nonconductive material must be inserted in the hole and an insulating bushing slipped into the sleeve at each end in such a manner as to keep the conductors absolutely out of contact with the sleeve. Each conductor must be carried through a separate tube or sleeve.

Conductors within 7 feet from the floor are considered exposed to physical damage. Where open conductors cross ceiling joints and wall studs and are exposed to physical damage, they must be protected.

#### **4.2 Cabinets, Boxes, and Fittings**

Conductors entering boxes, cabinets, or fittings must be protected from abrasion, and openings through which conductors enter must be effectively closed. Unused openings in cabinets, boxes, and fittings must also be effectively closed.

All pull boxes, junction boxes, and fittings must be provided with covers approved for the purpose. If metal covers are used they must be grounded. In completed installations each outlet box must have a cover, faceplate, or fixture canopy. Covers of outlet boxes having holes through which flexible cord pendants pass must be provided with bushings designed for the purpose or must have smooth, well rounded surfaces on which the cords may bear.

#### **4.3 Switches**

Single-throw knife switches must be connected so that the blades are dead when the switch is in the



## ABC Midwest Solutions 2022 Safety Program

open position. They must be placed so that gravity will not tend to close them. Those approved for use in the inverted position must be provided with a locking device that will ensure that the blades remain in the open position when so set. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal. However, if the throw is vertical a locking device must be provided to ensure that the blades remain in the open position when so set.

Flush snap switches that are mounted in ungrounded metal boxes and located within reach of conducting floors or other conducting surfaces must be provided with faceplates of nonconducting, noncombustible material.

### **4.4 Switchboards and Panelboards**

Switchboards that have any exposed live parts must be located in permanently dry locations and accessible only to qualified persons. Panelboards must be mounted in cabinets, cutout boxes, or enclosures approved for the purpose and must be dead front. However, panelboards other than the dead front externally-operable type are permitted where accessible only to qualified persons. Exposed blades of knife switches must be dead when open.

### **4.5 Enclosures for Damp or Wet Locations**

Cabinets, cutout boxes, fittings, boxes, and panelboard enclosures in damp or wet locations must be installed so as to prevent moisture or water from entering and accumulating within them. In wet locations the enclosures must be weatherproof.

Switches, circuit breakers, and switchboards installed in wet locations must be enclosed in weatherproof enclosures.



#### 4.6 Conductors for General Wiring

All conductors used for general wiring must be insulated unless otherwise permitted in this section. The conductor insulation must be of a type that is approved for the voltage, operating temperature, and location of use. Insulated conductors must be distinguishable by appropriate color or other suitable means as being grounded conductors, ungrounded conductors, or equipment grounding conductors.

#### 4.7 Flexible Cords and Cables

Flexible cords and cables must be approved and suitable for conditions of use and location. Flexible cords and cables must be used only for:

- Pendants
- Wiring of fixtures
- Connection of portable lamps or appliances
- Elevator cables
- Wiring of cranes and hoists
- Connection of stationary equipment to facilitate their frequent interchange
- Preventing the transmission of noise or vibration
- Appliances where the fastening means and mechanical connections are designed to permit removal for maintenance and repair
- Data processing cables approved as a part of the data processing system.

If used as permitted in #3, #6, or #8 above, the flexible cord must be equipped with an attachment ABC Midwest Solutions, LLC and must be energized from an approved receptacle outlet.

Unless specifically permitted in items 1-9 above, flexible cords and cables may not be used:

- As a substitute for the fixed wiring of a structure
- Where run through holes in walls, ceilings, or floors
- Where run through doorways, windows, or similar openings



## ABC Midwest Solutions 2022 Safety Program

- Where attached to building surfaces
- Where concealed behind building walls, ceilings, or floors.

Flexible cords used in show windows and showcases must be Type S, SO, SJ, SJO, ST, STO, SJT, SJTO, or AFS except for the wiring of chain-supported lighting fixtures and supply cords for portable lamps and other merchandise being displayed or exhibited.

A conductor of a flexible cord or cable that is used as a grounded conductor or an equipment grounding conductor must be distinguishable from other conductors. Types SJ, SJO, SJT, SJTO, S, SO, ST, and STO must be durably marked on the surface with the type designation, size, and number of conductors.

Flexible cords must be used only in continuous lengths without splice or tap. Hard service flexible cords No. 12 or larger may be repaired if spliced so that the splice retains the insulation, outer sheath properties, and usage characteristics of the cord being spliced.

Flexible cords must be connected to devices and fittings so that strain relief is provided that will prevent pull from being directly transmitted to joints or terminal screws.

### 4.8 Fixture Wires

Fixture wires must be approved for the voltage, temperature, and location of use. A fixture wire used as a grounded conductor must be identified.

Fixture wires may be used:

- For installation in lighting fixtures and in similar equipment where enclosed or protected and not subject to bending or twisting in use
- For connecting lighting fixtures to the branch-circuit conductors supplying the fixtures. Fixture wires may not be used as branch-circuit conductors except as permitted

for Class 1 power limited circuits

### 4.9 Equipment for General Use

#### **Lighting Fixtures, Lamp holders, Lamps, Rosettes and Receptacles**

Fixtures, lamp holders, lamps, rosettes, and receptacles may have no live parts normally exposed to employee contact. However, rosettes and cleat-type lamp



## ABC Midwest Solutions 2022 Safety Program

holders and receptacles located at least 8 feet above the floor may have exposed parts.

Handlamps of the portable type supplied through flexible cords must be equipped with a handle of molded composition or other material approved for the purpose, and a substantial guard must be attached to the lamp holder or the handle.

Lamp holders of the screw-shell type must be installed for use as lamp holders only. Lamp holders installed in wet or damp locations must be of the weatherproof type.

Fixtures installed in wet or damp locations must be approved for the purpose and must be constructed or installed so that water cannot enter or accumulate in wireways, lamp holders, or other electrical parts.

### **Receptacles, Cord Connectors, and Attachment ABC Midwest Solutions, LLC (Caps)**

Receptacles, cord connectors, and attachment ABC Midwest Solutions, LLC must be constructed so that no receptacle or cord connector will accept an attachment ABC Midwest Solutions, LLC with a different voltage or current rating than that for which the device is intended. However, a 20-ampere T-slot receptacle or cord connector may accept a 15- ampere attachment ABC Midwest Solutions, LLC of the same voltage rating.

A receptacle installed in a wet or damp location must be suitable for the location.

### **Appliances**

Appliances, other than those in which the current-carrying parts at high temperatures are necessarily exposed, may have no live parts normally exposed to employee contact.

A means must be provided to disconnect each appliance.

Each appliance must be marked with its rating in volts and amperes or volts and watts.

### **Motors, Motor Circuits, and Controllers**

If specified that one piece of equipment must be “in sight from” another piece of equipment, one must be visible and not more than 50 feet from the other.

A disconnecting means must be located in sight from the controller location. However, a single disconnecting means may be located adjacent to a group of





## ABC Midwest Solutions 2022 Safety Program

coordinated controllers mounted adjacent to each other or a multi-motor continuous process machine. The controller disconnecting means for motor branch circuits over 600 volts, nominal, may be out of sight of the controller, if the controller is marked with a warning label giving the location and identification of the disconnecting means that is to be locked in the open position.

The disconnecting means must disconnect the motor and the controller from all ungrounded supply conductors and must be designed so that no pole can be operated independently.

If a motor and the driven machinery are not in sight from the controller location, the installation must comply with one of the following conditions:

- The controller disconnecting means must be capable of being locked in the open position.
- A manually operable switch that will disconnect the motor from its source of supply must be placed in sight from the motor location.

The disconnecting means must plainly indicate whether it is in the open (off) or closed (on) position.

The disconnecting means must be readily accessible. If more than one disconnect is provided for the same equipment, only one need be readily accessible.

An individual disconnecting means must be provided for each motor, but a single disconnecting means may be used for a group of motors under any one of the following conditions:

- If a number of motors drive special parts of a single machine or piece of apparatus, such as a metal or woodworking machine, crane, or hoist
- If a group of motors is under the protection of one set of branch-circuit protective devices
- If a group of motors is in a single room in sight from the location of the disconnecting means.

Motors, motor-control apparatus, and motor branch-circuit conductors must be protected against overheating due to motor overloads or failure to start, and against short-circuits or ground faults. These provisions must not require overload protection that will stop a motor where a shutdown is likely to introduce additional or increased hazards, as in the case of fire pumps, or where continued operation of



## ABC Midwest Solutions 2022 Safety Program

a motor is necessary for a safe shutdown of equipment or process and motor overload sensing devices are connected to a supervised alarm.

Stationary motors having commutators, collectors, and brush rigging located inside of motor end brackets and not conductively connected to supply circuits operating at more than 150 volts to ground need not have such parts guarded. Exposed live parts of motors and controllers operating at 50 volts or more between terminals must be guarded against accidental contact by any of the following:

- By installation in a room or enclosure that is accessible only to qualified persons
- By installation on a suitable balcony, gallery, or platform, so elevated and arranged as to exclude unqualified persons
- By elevation 8 feet or more above the floor.

Where live parts of motors or controllers operating at over 150 volts to ground are guarded against accidental contact only by location, and where adjustment or other attendance may be necessary during the operation of the apparatus, suitable insulating mats or platforms must be provided so that the attendant cannot readily touch live parts unless standing on the mats or platforms.

### Transformers

The following paragraphs cover the installation of all transformers except the following:

- - Current transformers
  - Dry-type transformers installed as a component part of other apparatus
  - Transformers that are an integral part of an x-ray, high frequency, or electrostatic-coating apparatus
  - Transformers used with Class 2 and Class 3 circuits, sign and outline lighting, electric discharge lighting, and power-limited fire-protective signaling circuits
  - Liquid-filled or dry-type transformers used for research, development, or testing, where effective safeguard arrangements are provided.



## ABC Midwest Solutions 2022 Safety Program

Warning signs or visible markings on the equipment or structure must indicate the operating voltage of exposed live parts of transformer installations.

Dry-type, high-fire-point-liquid-insulated, and askarel-insulated transformers installed indoors and rated over 35kV must be in a vault.

If they present a fire hazard to employees, oil-insulated transformers installed indoors must be in a vault.

Combustible material, combustible buildings and parts of buildings, fire escapes, and door and window openings must be safeguarded from fires that may originate in oil-insulated transformers attached to or adjacent to a building or combustible material.

Transformer vaults must be constructed so as to contain fire and combustible liquids within the vault and to prevent unauthorized access. Locks and latches must be so arranged that a vault door can be readily opened from the inside.

Any pipe or duct system foreign to the vault installation may not enter or pass through a transformer vault.

Materials may not be stored in transformer vaults.

### **Capacitors**

All capacitors, except surge capacitors or capacitors included as a component part of other apparatus, must be provided with an automatic means of draining the stored charge after the capacitor is disconnected from its source of supply.

- Capacitors rated over 600 volts, nominal, must comply with the following additional requirements:
- Isolating or disconnecting switches (with no interrupting rating) must be interlocked with the load interrupting device or must be provided with prominently displayed caution signs to prevent switching load current.
- For series capacitors, the proper switching must be assured by use of at least one of the following:
  0. Mechanically sequenced isolating and bypass switches
  1. Interlocks



ABC Midwest Solutions 2022 Safety Program

2. Switching procedure prominently displayed at the switching location.

**Storage batteries**

Provisions must be made for sufficient diffusion and ventilation of gases from storage batteries to prevent the accumulation of explosive mixtures.

**5.0 Working On or Near Exposed Energized Parts**

**1. 5.1 Application**

This section applies to work performed on exposed live parts (involving either direct contact or contact by means of tools or materials) or near enough to them for employees to be exposed to any hazard they present.

**5.2 Work on Energized Equipment.**

Only qualified persons must work on electric circuit parts of equipment that have not been de-energized under the procedures state procedures. Such persons must be capable of working safely on energized circuits and must be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

**5.3 High voltage lines**

No work must be performed; no material must be piled, stored or otherwise handled; no scaffolding, commercial signs, or structures must be erected or dismantled; and no tools, machinery or equipment may be operated within the specified minimum distances from any energized high voltage electrical conductor capable of energizing the material or equipment, except where the electrical distribution and transmission lines have been de-energized and visibly grounded at point of work, or where insulating barriers not a part of or an attachment to the equipment have been erected.

To prevent physical contact with the lines, equipment must be operated proximate to, under, over, by, or near powerlines only in accordance with the following:

For lines rated 50 kV or below, minimum clearance between the lines and any part of the equipment or load must be 10 feet.

For lines rated over 50 kV minimum, clearance between the lines and any part of the equipment or load must be 10 feet ABC Midwest Solutions, LLC 0.4 inch for each 1 kV over 50 kV or twice the length of the line insulator, but never less than 10 feet.



## ABC Midwest Solutions 2022 Safety Program

Where overhead electric conductors are encountered in proximity to a work area, the employer must be responsible for:

- Ascertaining the voltage and minimum clearance distance required,
- Maintaining the minimum clearance distance, and
- Ensuring that the other requirements of this section are complied with.

### 5.4 Low Voltage Lines.

When work is being carried out in proximity to energized electrical service conductors operating at 750 volts or less, such work must be performed in a manner to prevent contact by any worker with the energized conductors.

### 5.5 Overhead lines.

If work is to be performed near overhead lines, the lines must be de-energized and grounded, or other protective measures must be provided before work is started. If the lines are to be de-energized, arrangements must be made with the person or organization that operates or controls the electric circuits involved to de-energize and ground them. If protective measures such as guarding, isolating, or insulating are used, these precautions must prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

### 5.6 Unqualified persons.

When an unqualified person is working in an elevated position, or on the ground, near overhead lines, the location must be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:

- - For voltages to ground 50kV or below–10 ft.
  - For voltages to ground over 50kV–10 ft ABC Midwest Solutions, LLCs 0.4 inch for every 1kV over 50kV.

### 5.7 Qualified persons.

When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person must not approach or take any



## ABC Midwest Solutions 2022 Safety Program

conductive object without an approved insulating handle closer to exposed energized parts than listed in 5.3 and 5.4 above unless:

- The person is insulated from the energized part (gloves, with sleeves if necessary, rated for the voltage involved; or
- The energized part is insulated both from all other conductive objects at a different potential and from the person; or
- The person is insulated from all conductive objects at a potential different from that of the energized part.

### 5.8 Vehicular and Mechanical Equipment

Any vehicular or mechanical equipment capable of having parts of its structure elevated near energized overhead lines must be operated so that a clearance of 10 ft is maintained. If the voltage is higher than 50kV, the clearance must be increased 0.4 inches for every 1kV over that voltage. However, under any of the following conditions, the clearance may be reduced:

- - If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. If the voltage is higher than 50kV, the clearance must be increased 0.4 inch for every 1kV over that voltage.
  - If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

Employees standing on the ground must not contact the vehicle or mechanical equipment or any of its attachments, unless:

- - The employee is using protective equipment rated for the voltage
  - The equipment is located so that no un-insulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in this section.

If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees



## ABC Midwest Solutions 2022 Safety Program

working on the ground near the point of grounding must not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, must be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, that can develop within the first few feet or more outward from the grounding point.

### **5.9 Illumination**

Employees must not enter spaces containing exposed energized parts, unless illumination is provided that enables the employees to perform the work safely.

Where lack of illumination or an obstruction precludes observation of the work to be performed, employees must not perform tasks near exposed energized parts. Employees must not reach blindly into areas that may contain energized parts.

### **5.10 Confined or Enclosed Work Spaces**

When an employee works in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, the employer must provide, and the employee must use, protective shields, protective barriers, or insulating materials as necessary to avoid inadvertent contact with these parts. Door hinged panels and the like must be secured to prevent their swinging into an employee and causing the employee to contact exposed energized parts.

### **5.11 Conductive Materials and Equipment**

Conductive materials and equipment that are in contact with any part of an employee's body must be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee must handle long dimensional conductive objects (such as ducts and pipes) in areas with exposed live parts, the employer must institute work practices (such as the use of insulation, guarding, and material handling techniques) that will minimize the hazard.

### **5.12 Portable Ladders**

Portable ladders must have nonconductive side rails if they are used where the employee or the ladder could contact exposed energized parts.

### **5.13 Conductive Apparel**

Conductive articles of jewelry and clothing (such as watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) must not be worn if they might contact exposed energized parts.



#### 5.14 Housekeeping Duties

Where live parts present an electrical contact hazard, employees must not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided.

Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) must not be used in proximity to energized parts unless procedures are followed that will prevent electrical contact.

#### 5.15 Interlocks

Only a qualified person following the requirements of this section may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system must be returned to its operable condition when this work is completed.

### 6.0 Training

Scope. The training requirements contained in this section apply to employees who face a risk of electrical shock that is not reduced to a safe level by the electrical installation requirements of the state code. *Note: Employees in occupations listed below face such a risk and are required to be trained. Other employees who also may reasonably be expected to face a considerable risk of injury due to electric shock or electrical hazards must also be trained.*

- - Blue collar supervisors<sup>1</sup>
  - Electrical and electronic engineers.<sup>1</sup>
  - Electrical and electronic equipment assemblers.<sup>1</sup>
  - Electrical and electronic technicians.<sup>1</sup>
  - Electricians.
  - Industrial machine operators.<sup>1</sup>
  - Material handling equipment operators.<sup>1</sup>
  - Mechanics and repairers.<sup>1</sup>
  - Painters.<sup>1</sup>





## ABC Midwest Solutions 2022 Safety Program

- Riggers and roustabouts.<sup>1</sup>
- Stationary engineers.<sup>1</sup>
- Welders.

<sup>1</sup>Workers in these groups do not need to be trained if their work or the work of those supervise does not bring them or the employees they supervise close enough to exposed parts of electric circuits at 50 volts or more to ground for a hazard to exist.

### 1. 6.1 Contents of Training.

Employees must be trained in and familiar with the safety-related work practices required by the state code that pertain to their respective job assignments.

Employees who are not qualified persons must also be trained in and familiar with any electrically related safety practices not specifically addressed by the state code but which are necessary for their safety.

Qualified persons (i.e., those permitted to work on or near exposed energized parts) must, at a minimum, be trained in and familiar with the following:

- - The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment
  - The skills and techniques necessary to determine the nominal voltage of exposed live parts
  - The clearance distance specified in the state code and the corresponding voltages to which the qualified person will be exposed.

The training required by this section must be of the classroom or on-the-job type.

The degree of training provided must be determined by the risk to the employee.



## 5. Fall Protection Procedures

### **Fall Protection**

#### **1.0 Fall Protection Introduction**

If an employee is exposed to a fall hazard of ten (10) feet or more in height, the employee must use a fall restraint, fall arrest system, or positioning device system as described below.

Exceptions:

- - The provisions of this part do not apply when employees are making an inspection, investigation, or assessment of work-place conditions prior to the actual start of construction work or after all construction work has been completed,
  - Employees engaged in roofing on low-pitched (slope equal to or less than 4 in 12) roofs less than 50 feet wide, may elect to use a safety monitor system without warning lines.

#### **2.0 Responsibilities**

##### **1. 2.1 Competent Person**

A “competent person” is an individual knowledgeable of fall protection equipment, including the manufacturer’s recommendations and instructions for the proper use, inspection, and maintenance; and who is capable of identifying the existing and potential fall hazards; and who has the authority to take prompt corrective action to eliminate those hazards; and who is knowledgeable of the rules contained in this section regarding the erection, use, inspection, and maintenance of fall protection equipment and systems.

Supervisors can use the evaluation form in Appendix A to evaluate an employee for appointment as a competent person. Competence must be demonstrated, and training provided to establish and maintain competence.



## ABC Midwest Solutions 2022 Safety Program

The competent person evaluates conditions:

- Identifies hazards
- Selects fall systems
- Trains users
- Fills out fall protection plans
- Installs systems
- Supervises
- Monitors
- Enforces
- Inspects
- Stops work when necessary

### 2.2 Qualified Person

One who has a recognized degree, certificate, or professional standing, or who has successfully demonstrated the ability to resolve fall protection and rescue problems.

The qualified person will design, install, and supervise:

- Horizontal lifelines
- Emergency removal (Coordinate with Fire Department before incident happens)
- Development of fall protection plan
- Evaluate anchorage on structures

The manufacturer of Fall Arrest System components is the qualified person as long as we install them per instructions.

### 2.3 Supervisor

- Appoint one or more employees to be the competent person. Use the evaluation form in Appendix A to evaluate employees for appointment as competent employees



## ABC Midwest Solutions 2022 Safety Program

- Ensure employees are trained to identify and control fall hazards
- Enforce compliance with fall protection standards

### 2.4 Contractors and Affected Employees

Employees who have been assigned to work in areas where fall hazards exist must:

- Be knowledgeable in the fall protection equipment and procedures that apply to its proper use.
- Inspect fall protection devices and systems before use.
- Be able to fill out a fall protection work-site safety plan. (Appendix B)
- Identify existing hazards.
- Correct existing hazards.

Contractors must provide a copy of their Fall Protection Work Plan to the ABC Midwest Solutions, LLC project manager before starting work on ABC Midwest Solutions, LLC facilities.

## 3.0 Training

Employees who have fall exposures must be trained to identify those exposures. If an employee will require the use of fall arrest system equipment, the employee shall be trained to use and maintain the equipment.

### 4.0 Fall Protection Work Plan

A fall protection work plan will be filled out for each instance where fall protection is required. See Work Plan Form in Appendix B.

Employees who have received fall protection training are capable of identifying workplace hazards, filling out the fall protection work-site plan, and are expected to correct, wherever possible, unsafe workplace conditions that they may be exposed. Every employee has the authority to correct hazards when they are able to do so. If they are unable to correct the hazard, or provide adequate protection, then work must be postponed until the supervisor and/or competent person can be contacted for guidance in correcting the hazards.

#### 1. 4.1 Emergency Response

An employee who falls must be rescued within 15 minutes to avoid permanent physical harm. The local fire department should be notified before the work is done



## ABC Midwest Solutions 2022 Safety Program

in order to prepare for a prompt and effective rescue. The Environmental Health & Safety Manager can assist you in coordinating emergency response planning for your fall protection work plan.

### **5.0 Safe Access to Elevated Surfaces**

All employees of ABC Midwest Solutions, LLC will ensure that they use safe access to get onto and off of an elevated surface. Employees will ensure that they do not expose themselves to a fall hazard by walking across a roof surface without a properly adjusted lifeline that is hooked to a proper anchor.

### **6.0 Fall Protection Equipment**

Fall Protection equipment includes, but is not limited to, the following:

#### **1. 6.1 Full Body Harness**

An approved Class III full body harness must be used. The harness must properly fit the employee who will be using it.

#### **6.2 Lanyards and Lines**

- Safety lines and lanyards will be protected against being cut or abraded.
- Lanyards must be adjusted so their length is only long enough to allow the employee the ability to move to the sides or edge of the roof, and no further. The reason for this is to prevent the employee from being able to actually fall off of the roof.
- Lanyards must have a minimum tensile strength of 5,000 pounds.
- The attachment point of the lanyard to the body harness must be located in the center of the wearer's back near shoulder level, or above the wearer's head.

#### **6.3 Hardware**

- Hardware must be drop forged, pressed or formed steel, or made of materials equivalent in strength.
- Hardware must have a corrosion resistant finish, and all surfaces and edges must be smooth to prevent damage to the attached body harness or lanyard.



## ABC Midwest Solutions 2022 Safety Program

- All components of body harness systems, unless otherwise specified, must be capable of supporting a minimum fall impact load of 5,000 pounds (fall arrest) or 4,000 pounds (fall restraint) applied at the lanyard point of connection.
- Employees are not allowed to use Vertical or Horizontal lifelines.

### 6.4 Anchors

- Full body harness systems used for fall arrest must be secured to anchorages capable of supporting 5,000 pounds per employee.
- Anchorage points used for fall restraint must be capable of supporting four (4) times the intended load.

### 6.5 Snap Hooks

- Snap hooks must be self-closing and self-locking
- Snap hooks may not be connected to loops made in webbing type lanyards.
- Snap hooks may not be connected to each other.
- Not more than one snap hook may be connected to any one D ring unless they are the double locking type.

### 6.6 Inspection of Components

- Full body harness systems must be inspected prior to each use. Inspect for mildew, wear, damage, other deterioration, and defective components. Remove from service when the function or strength has been adversely affected.
- Systems or components that have been subjected to impact loading (a fall) must be immediately removed from service and not used again unless inspected and determined by a competent person to be undamaged and suitable for reuse.
- Fall protection equipment must be inspected at least twice each year by a "competent person" according to the manufacturer's recommendations. This inspection shall be recorded. Defective equipment shall be removed from service immediately.

### 6.7 Storage



## ABC Midwest Solutions 2022 Safety Program

Fall protection equipment shall be stored where protected from environmental factors, such as heat, light, excessive moisture, oil, chemicals and vapors, and any other damaging factors.

### 7.0 Guarding Of Low Pitched Roof Perimeters

#### 1. 7.1 General provisions

During the performance of work on low-pitched roofs with a potential fall hazard greater than 10 feet, all employees engaged in the work must use the proper protection as follows:

- Fall restraint or fall arrest systems
- Warning line and safety monitor combination system when they are working between the warning line and the roof edge.
- Mechanical equipment can only be used or stored in areas where employees are protected by a warning line system, or fall restraint, or fall arrest systems. Mechanical equipment cannot be used or stored where the only protection is provided by the use of a safety monitor.

#### 7.2 Exceptions

- - Fall restraint or fall arrest systems are not required at points of access such as stairways, ladders, and ramps, or when employees are on the roof only to inspect, investigate, or estimate roof level conditions.
  - Employees engaged in roofing on low-pitched roofs less than fifty (50) feet wide, may elect to use a safety monitor system without warning lines.

#### 7.3 Warning Line Systems

Warning lines must be erected around all sides of the work area.

- When mechanical equipment is not being used, the warning line must be erected not less than 6 feet from the edge of the roof.
- When mechanical equipment is being used, the warning line must be erected not less than 6 feet from the roof edge that is parallel to the direction of mechanical equipment operation, and not less than 10



## ABC Midwest Solutions 2022 Safety Program

feet from the roof edge that is perpendicular to the direction of mechanical equipment operation.

The warning line must consist of a rope, wire, or chain and supporting stanchions erected as follows:

- - The rope, wire, or chain must be flagged at not more than 6-foot intervals with high visibility material.
  - The rope, wire, or chain must be rigged and supported in such a way that its lowest point (including sag) is no less than 36 inches from the roof surface and its highest point is no more than 42 inches from the roof surface.
  - After being erected, with the rope, wire or chain attached, stanchions must be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the roof surface, perpendicular to the warning line, and in the direction of the roof edge.
  - The rope, wire, or chain must have a minimum tensile strength of 200 pounds, and after being attached to the stanchions, must be capable of supporting, without breaking, the loads applied to the stanchions.
  - The line must be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.

Access paths must be erected as follows:

- Points of access, materials handling areas, and storage areas must be connected to the work area by a clear access path formed by two warning lines.
- When the path to a point of access is not in use, a rope, wire, or chain, equal in strength and height to the warning line, must be placed across the path at the point where the path intersects the warning line erected around the work area.

### 7.4 Roofing Brackets





## ABC Midwest Solutions 2022 Safety Program

A roofing bracket is a bracket used in sloped roof construction, having provisions for fastening to the roof or supported by ropes fastened over the ridge and secured to some suitable object.

- Roofing brackets may be constructed to fit the pitch of the roof.
- Brackets can be secured in place by nailing in addition to the pointed metal projections. The nails shall be driven full length into the roof.

### 8.0 Roof Edge Material Handling Areas

Employees working in a roof edge materials handling or materials storage area located on a low pitched roof with a ground to eave height greater than 10 feet must be protected from falling along all unprotected roof sides and edges of the area.

- - When guardrails are used at hoisting areas, a minimum of 4 feet of guardrail must be erected on each side of the access point through which materials are hoisted.
  - A chain or gate must be placed across the opening between the guardrail sections when hoisting operations are not taking place.
  - When guardrails are used at bitumen pipe outlet, a minimum of 4 feet of guardrail must be erected on each side of the pipe.
  - When safety belt/harness systems are used, they must not be attached to the hoist.
  - When fall restraint systems are used, they must be rigged to allow the movement of employees only as far as the roof edge.
  - Materials must not be stored within 6 feet of the roof edge unless guardrails are erected at the roof edge.



## 6. Grounds: Power Tools and Lawnmowers

### Grounds - Powered Tools

#### 1.0 General Requirements

Proper hearing protection, eye and footwear protection must be worn where there is a hazard from excessive noise (above 85 dBA) or from projected objects.

Walk-behind, riding-rotary, and reel power lawnmowers designed for use by employees must meet the design specifications in "American National Standard Safety Specifications for Power Lawnmowers" ANSI B71.1-1998 and B71.41999. These specifications do not apply to sully-type mowers, flail mowers, sickle-bar mowers, or mowers designed for commercial use.

All power-driven chains, shafts, belts, gears, nip / pinch points and any exposed components hot enough to cause burns must be positioned or otherwise guarded to prevent the operator's accidental contact, during normal starting, mounting, and operation of the machine.

A shutoff device must be provided to stop operation of the motor or engine. This device must require manual and intentional reactivation to restart the motor or engine.

All positions of the operating controls must be clearly identified. Warning and caution labels or decals must be readable and replaced as necessary. The words, "Caution – Be sure the operating control(s) is in neutral before starting the engine," or similar wording must be clearly visible at an engine starting control point on self-propelled mowers.

Operator: wearing personal protective equipment (footwear, eye, hand and hearing protection), is thoroughly familiar with equipment operating instructions, controls and proper guards, plates, grass catcher or other safety devices are in place prior to starting the mower.

#### 2.0 Walk-Behind and Riding Rotary Mowers

The mower blade must be enclosed except on the bottom and the enclosure must extend to or below the lowest cutting point of the blade in the lowest blade position.

Guards that must be removed to install a catcher assembly must meet the following requirements:

-



## ABC Midwest Solutions 2022 Safety Program

- Warning instructions must be affixed to the mower near the opening stating that the mower must not be used without either the catcher assembly or the guard in place.
- The catcher assembly or the guard must be installed on newly purchased mowers before they are put into use.
- The instruction manual must state that the mower must not be used without either the catcher assembly or the guard in place.
- The catcher assembly, when properly and completely installed, must not create a condition that violates the limits given for the guarded opening.

Modifications to openings in the blade enclosure must meet state code safety standards, which says, "Openings in the blade enclosure, intended for the discharge of grass, shall be limited to a maximum vertical angle of the opening of 30 degrees. Measurements shall be taken from the lowest blade position."

Operators must mow across the face of the slope.

The word "caution" or stronger wording must be placed on the mower at or near each discharge opening. Blade(s) must stop rotating from the manufacturer's specified maximum speed within 15 seconds after declutching, or shutting off power.

In a multipiece blade, the means of fastening the cutting members to the body of the blade or disc must be designed so that they will not become worn enough to create a hazardous condition.

The maximum tip speed of any blade must be 19,000 feet per minute.

### **3.0 Walk-Behind Rotary Mowers**

The horizontal angle of the opening(s) in the blade enclosure that are intended for the discharge of grass must not contact the operator area.

There must be one of the following at all openings in the blade enclosure intended for the discharge of grass:

- A minimum unobstructed horizontal distance of 3 inches from the end of the discharge chute to the blade tip circle; or
- A rigid bar fastened across the discharge opening, secured to prevent removal without the use of tools. The bottom of the bar must be no higher than the bottom edge of the blade enclosure.



## ABC Midwest Solutions 2022 Safety Program

The highest point(s) on the front of the blade enclosure, except discharge openings, must be such that any line extending a maximum of 15° downward from the horizontal toward the blade shaft axis (axes) must not intersect the horizontal plane within the blade tip circle. The highest point(s) on the blade enclosure front, except discharge-openings, must not exceed 1¼ inches above the lowest cutting point of the blade in the lowest blade position. Mowers with a swing over handle are to be considered as having no front in the blade enclosure and therefore must have an enclosure that extends to or below the cutting point of the blade per state code.

The mower handle must be fastened to the mower to prevent loss of control by unintentional uncoupling while in operation.

A positive up stop or latch must be provided for the mower handle in the normal operating position(s). The up stop must not be subject to unintentional disengagement during normal operation of the mower. The up stop or latch must not allow the center or the handle grips to come closer than 17 inches horizontally behind the closest path of the mower blade(s) unless manually disengaged.

A swing-over handle, which complies with the above requirements, is permitted.

Wheel drive-disengaging controls, except Deadman controls, must move opposite to the direction of the vehicle motion in order to disengage the drive. Deadman controls must comply with the state code and may operate in any direction to disengage the drive.

### **4.0 Riding Rotary Mowers**

Passengers are not permitted on riding mowers.

Operator looks down and behind before and while moving backwards.

The highest point(s) of all openings in the blade enclosure, front must be limited by a vertical angle of opening of 15° and a maximum distance of 1¼ inches above the lowest cutting point of the blade in the lowest blade position.

Opening(s) must be placed so that grass or debris will not discharge directly toward any part of an operator seated in a normal operator position.

There must be one of the following at all openings in the blade enclosure intended for the discharge of grass:

- A minimum unobstructed horizontal distance of 6 inches from the end of the discharge chute to the blade tip circle.



## ABC Midwest Solutions 2022 Safety Program

- A rigid bar fastened across the discharge opening, secured to prevent removal without the use of tools. The bottom of the bar must be no higher than the bottom edge of the blade enclosure.

Mowers must be provided with stops to prevent jackknifing or locking of the steering mechanism. Vehicle stopping means must be provided.

Hand-operated wheel drive disengaging controls must move opposite to the direction of vehicle motion in order to disengage the drive. Foot-operated wheel drive disengaging controls must be depressed to disengage the drive. Deadman controls, both hand and foot operated, must comply with the state code and may operate in any direction to disengage the drive.

### 5.0 Protection from fuel and exhaust

Gas cap is on whenever engine is running and engine is shut off before and during refueling. Equipment must not be refueled in doors. Do not run engine in a closed area.

### 6.0 Definition of Terms

**Blade tip circle**– The path described by the outermost point of the blade as it is rotated about its shaft axis.

**Catcher assemblies**– Parts or combinations of parts that provide a means for collecting grass clippings or debris.

**Deadman control**– A control designed so that it will automatically interrupt power to a drive when the operator's actuating force is removed.

**Guards**– A part or an assembly provided for shielding a hazardous area of a machine.

**Lowest blade position**– The lowest blade position under static conditions.

**Operator area-walk-behind mowers.** For discharge interference purposes, that area confined within a circle no smaller than 30 inches in diameter, the center of which is located to the rear of the mower on its longitudinal centerline 30 inches behind the nearest blade tip circle.

**Power reel mower**– A lawn-cutting machine utilizing a power source to rotate one or more helically formed blades about a horizontal axis to provide a shearing action with a stationary cutter bar or bed knife.

**Power rotary mower**– A lawn-cutting machine utilizing a power source to rotate one or more cutting blades about a vertical axis.

**Riding mower**– A powered, self-propelled lawn-cutting vehicle on which the operator rides and controls the machine.

**Sulky type mower**– Normally, a walk-behind mower that has been converted to a riding mower by the addition of a sulky.

**Walk-behind mower**– A mower either pushed or self-propelled and normally guided by the operator walking behind the unit.



## 7. Chemical Hazard Communication Program

### 1.0 Introduction

ABC MIDWEST SOLUTIONS, LLC employees can review a copy of this written program in the office and the website of the Environmental Health & Safety Manager.

The purpose of the Chemical Hazard Communication Program is to ensure that all affected employees are aware of the dangers associated with hazardous materials used at ABC Midwest Solutions, LLC.

### 2.0 Responsibilities

#### 1. 2.1 Supervisors

- Verify container labeling Maintain Safety Data Sheets (SDS) binder and list of hazardous products
- Forward SDS and updated hazardous products lists to Environmental Health & Safety office
- Arrange employee training
- Review new SDS for new hazards and controls and train affected employees
- Duties may be delegated

### 3.0 Common Hazardous Chemical Procedures

The manufacturer's recommended procedures must always be followed. These procedures can be found on each Safety Data Sheet (SDS). Safety Data Sheets are explained in Section 5.0.

No employee is permitted to use a hazardous chemical product until the SDS is on site.

No employee is permitted to use a hazardous chemical product until the employee has had chemical hazard communication training.

Approved containers must be used for gasoline and other flammable or combustible solvents. Equipment power cords must be disconnected before the equipment is cleaned with solvents. Proper ventilation must be used when there is the possibility of fumes or vapors accumulating

### 4.0 Container Labeling



## ABC Midwest Solutions 2022 Safety Program

All containers of hazardous materials, including those in academic laboratories, at ABC Midwest Solutions, LLC must have securely affixed warning labels. This requirement applies to all hazardous materials, whether purchased before or after the effective date of this program.

The labels must be prominently displayed, written in English, and clearly legible. It is strongly encouraged that departments use the GHS labeling system, which uses pictograms to identify health and physical hazards. Please contact the Environmental Health & Safety Manager for more information.

The original manufacturer's label or a hand-written label will be acceptable, if the hand written label contains the original information and is clearly legible, in English.

### 1. 4.1 Primary Containers

On the primary (original) container, labels must include the following information:

- Identity of the hazardous chemical in the container. The chemical or product name must correspond to a specific Safety Data Sheet with the same name.
- Appropriate chemical labels must have a signal word (i.e. "Danger" or "Warning"), hazard statement, precautionary statement, pictogram, or combination thereof, which provides at least general information regarding the hazards of the chemical. The label when used in conjunction with the other information immediately available to the employee (i.e. SDS, manufacturer) will provide specific information regarding the physical or health hazards of the chemical.

### 4.2 Secondary Containers

Repackaged secondary or temporary hazardous chemical containers must be labeled with the name and pictogram that was included on the primary container.

### 4.3 Annual Review and Updating

The University Safety Committee will periodically review the effectiveness of the campus labeling program and recommend that it be updated, if needed.

## 5.0 Safety Data Sheets (SDS's)

Copies of Safety Data Sheets (SDS) will be available to all affected employees for all hazardous chemicals located at ABC Midwest Solutions, LLC.



## ABC Midwest Solutions 2022 Safety Program

Each department will keep a binder of Safety Data Sheets for the chemicals used in that work area. The SDS binder will be readily available for review by all employees during each work shift. Copies will be available to the employee upon request.

The Environmental Health & Safety Manager is responsible for establishing and monitoring the SDS system, including procedures for obtaining SDS. The manufacturers of hazardous chemicals are required to supply SDS for their products. The user shall forward a copy of all SDS received to the Environmental Health & Safety Manager so that a complete set of SDS for all hazardous materials on the ABC MIDWEST SOLUTIONS, LLC campus will be maintained in one office.

### 1. 5.1 Reviewing and Updating MSDS's

Each supervisor will review incoming SDS for new and significant health or safety information and will see that any new information is passed on to affected employees through training. SDS's will be updated as new products are added or old ones discontinued.

## 6.0 New Product Hazards

Before any new chemical is introduced into the work place, each employee will be given hazardous product information in the same manner as during the initial Chemical Hazard Communication training. The employee's supervisor is responsible for providing this information.

### 1. 6.1 New Chemical Labeling & MSDS's

Each supervisor must verify that new containers of hazardous chemicals are properly labeled before they are brought into the specific work area. Labels must be legible. SDS on new chemicals must be entered into the departments SDS folder.

## 7.0 List of Hazardous Chemicals

The supervisor of each work area is responsible for keeping an up-to-date list or inventory of hazardous chemicals used in that area. The list must refer to a chemical by the same name(s) used on the corresponding Safety Data Sheet (SDS) and the container label. This list must be kept with the binder containing the SDS for these hazardous chemicals. This list and the SDS binder must be available for review by employees during any work shift.

The supervisor must note the date a new hazardous chemical is added to, or taken from the list. A revised list and a copy of the SDS must be forwarded to the Environmental Health & Safety Manager. The Environmental Health & Safety Manager will maintain an





archive SDS file for hazardous products that are no longer on site, as an historical record.

## 8.0 Hazardous Non-Routine Tasks

Employees may be required to perform non-routine tasks involving hazardous products. Prior to starting work on such projects, each affected employee will be given information by his/her supervisor about hazardous chemicals to which they may be exposed during such activity. This information will include:

- Specific chemical hazards.
- Protective/safety measures the employee can take.
- Measures the University has taken to lessen the hazards including ventilation, personal protective equipment, product substitution, presence of another employee, and emergency procedures.

It is ABC MIDWEST SOLUTIONS, LLC policy that no employee will begin work in a confined space or on any non-routine task involving hazardous materials without first receiving a safety briefing from the department supervisor.

## 9.0 Informing Contractors

It is the responsibility of the ABC Midwest Solutions, LLC to provide contractors with information regarding hazardous chemicals in the contractor's work area. The notification shall be in writing and will include:

- ABC MIDWEST SOLUTIONS, LLC safety rules and website address for information on what they are required to comply with.
- Hazardous chemicals to which they may be exposed while on the job site.
- Measures the contractor's employees may take to lessen the possibility of exposure.
- Steps ABC MIDWEST SOLUTIONS, LLC has taken to lessen the risks of chemical exposure or injury.
- Availability and location of SDS for all hazardous chemicals used at ABC MIDWEST SOLUTIONS, LLC.
- Emergency procedures to follow in case of exposure.

It is the contractor's responsibility to notify ABC MIDWEST SOLUTIONS, LLC's Project Manager or the Environmental Health & Safety Manager, in writing, when hazardous



## ABC Midwest Solutions 2022 Safety Program

chemicals will be brought onto campus. The contractor will provide the following information:

- Specific hazards for materials brought to the ABC MIDWEST SOLUTIONS, LLC campus
- SDS for hazardous materials brought to the ABC MIDWEST SOLUTIONS, LLC campus.
- Protective/safety measures to minimize exposure of the ABC MIDWEST SOLUTIONS, LLC community to hazardous materials.
- Emergency procedures to be used when a hazardous chemical is released.

### **10.0 Employee Training and Information**

All employees of ABC Midwest Solutions, LLC who may be exposed to hazardous chemicals at ABC MIDWEST SOLUTIONS, LLC will be provided information and training on the chemicals in their work area. Prior to starting work, each new employee with potential exposure to hazardous products will attend a health and safety orientation and will receive information and training on the following:

- An overview of the requirements contained in the Chemical Hazard Communication Standard.
- Hazardous chemicals present in his/her work places or operations.
- Location and availability of ABC MIDWEST SOLUTIONS, LLC's written Chemical Hazard Communication Program.
- Physical and health effects of the hazardous chemicals used in his/her work place.
- Methods and observation techniques used to determine the presence or release of hazardous chemicals in the work area.
- How to lessen or prevent exposure to hazardous chemicals through use of control procedures, work practices, and personal protective equipment.
- Steps ABC MIDWEST SOLUTIONS, LLC has taken to lessen or prevent exposure to these chemicals.
- Emergency procedures to follow if exposed to these chemicals.
- How to read GHS labels and review Safety Data Sheets to obtain appropriate hazard information.



## ABC Midwest Solutions 2022 Safety Program

- Location and availability of the Safety Data Sheet file and lists of hazardous chemicals present in the employee's work area.

It is the responsibility of the supervisor to ensure that employees have received this training before working in an area with hazardous chemicals.

Periodic notices will be posted on the employee bulletin boards, which provide an explanation of the GHS container labeling system and the location of ABC MIDWEST SOLUTIONS, LLC's written Chemical Hazard Communication Program.

The Environmental Health & Safety Manager will be responsible for assisting supervisors in arranging the employee training and information program.

### **11.0 Emergency Procedures**

In case of a chemical spill or accidental exposure to hazardous chemicals, immediately call 911. Refer to the appropriate SDS for emergency instructions and relay this information to Campus Safety.

### **12.0 Disposing of Hazardous Materials**

A hazardous material is any substance in any quantity or form that could jeopardize health, safety, or property. Such materials include toxic chemicals, flammable liquids or solids, poisons, corrosives, compressed gases and others. Approval must be obtained from the ABC MIDWEST SOLUTIONS, LLC Environmental Health & Safety Manager before disposing of potentially hazardous material according to ABC MIDWEST SOLUTIONS, LLC's Hazardous Materials Disposal Plan.



## 8. Hearing Conservation Program

### Hearing Conservation Program

#### Introduction

This hearing conservation program applies to those employees who are exposed to noise levels that equal or exceed an 8-hour time-weighted average (TWA) sound level of 85 decibels (dB). Noise exposures should be computed in accordance with State Law, without regard to the fact that personal protective equipment may reduce employee noise exposure.

The following examples are typical of high noise level environments that can be found at ABC MIDWEST SOLUTIONS, LLC:

- Grounds maintenance equipment
- Machine shops
- Compressed air environments
- Boiler rooms
- Dish rooms

The table below (from the State code referenced above) is used to determine worker exposure and the actions required by ABC MIDWEST SOLUTIONS, LLC to protect workers from harmful noise levels.



ABC Midwest Solutions 2022 Safety Program

<b>Table 1 Noise Evaluation Criteria</b>		
<b>Criteria</b>	<b>Description</b>	<b>Requirements</b>
85 dBA TWA <sub>8</sub>	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must have a hearing loss prevention program.	Hearing protection Training Audiometric testing
90 dBA TWA <sub>8</sub>	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must reduce employee noise exposures in the workplace.	Noise controls Hearing protection Training Audiometric testing
115 dBA measured using slow response	Extreme noise level (greater than one second in duration).	Hearing protection Signs posted in work areas warning of exposure
140 dBC measured using fast response	Extreme impulse or impact noise (less than one second in duration).	Hearing protection



## 9. Lockout / Tagout Program

### **Lockout/Tagout Program**

#### **1.0 Introduction**

The purpose of the Lockout/Tagout program at ABC Midwest Solutions, LLC (ABC MIDWEST SOLUTIONS, LLC) is to establish procedures to ensure that all machines or equipment are stopped and isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where unexpected energization or startup of the machine or equipment or release of stored energy could cause injury, such as an unexpected release of steam.

#### **2.0 Application**

The procedures in this program apply to any energy source in which direct or stored energy could cause injury to employees at ABC MIDWEST SOLUTIONS, LLC. These energy sources include, but are not limited to, electrical, mechanical, hydraulic, pneumatic, chemical, and thermal energy.

#### **3.0 Compliance**

All affected employees are required to comply with this program. Because of the potential deadly nature of uncontrolled energized equipment or machines, strict disciplinary procedures will be followed for employees violating these rules. .

#### **4.0 Responsibilities**

All employees will be made aware of the provisions of this program as those provisions apply to the employee's role. The types of employees covered by this program are:

##### **1. 4.1 Authorized**

An employee who locks out or tags out machines or equipment in order to service or maintain that machine.

##### **4.2 Affected**

An employee whose job requires him/her to operate or use a machine or equipment on which service or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such service or maintenance is being performed.



## ABC Midwest Solutions 2022 Safety Program

Whenever a ABC Midwest Solutions, LLC employee encounters or observes a machine control or electrical panel switch that has been locked out or tagged out, no attempt shall be made to start the machine or activate the switch. The proper procedure is to contact the person whose name is on the tag or lock. That person may remove the lock or tag.

*Per Sections 11 and 12, it is expressly forbidden for any person, other than a supervisor or the authorized employee who installed the tag or lockout, to remove the lock or activate a tagged power panel, valve, switch, or piece of power equipment. Failure to follow this procedure could result in serious damage, injury or even loss of life and may result in disciplinary action.*

### 5.0 Training Requirements

All employees who service and/or maintain equipment or machines, or who must remove or bypass guarding during normal production activities, will be trained in this program. Training records containing the employee's name and date of training must be retained by the supervisor and placed in the employee's personnel file.

#### 1. 5.1 Initial Training

Authorized employee training will include:

- Recognition of hazardous energy sources
- The types and magnitude of energy in the workplace
- Methods for energy isolation/control

Affected employee training will include:

- The purpose and use of energy control procedures
- Prohibition on restarting machines or equipment

#### 5.2 Retraining

Retraining will be provided when periodic inspection reveals that an employee may not be aware of procedures, or whenever there is a change in job assignments; a change in machine, equipment, process or a change in energy control procedures that presents a new hazard.

### 6.0 Responsibilities

#### 1. 6.1 Director Environmental, Health, Safety & Emergency Programs (EHS&EP)



## ABC Midwest Solutions 2022 Safety Program

The Director EHS&EP responsible for assisting supervisors in arranging employee training and retraining programs on this procedure.

### 6.2 Management Responsibilities

- Each supervisor will assure that the locks and devices required for compliance with the procedures are provided to authorized employees as needed.
- Each supervisor of authorized and affected employees is responsible for effectively enforcing compliance with the lockout procedure in his/her department. Enforcement includes the use of corrective disciplinary action where necessary for violations of procedures.
- Managers shall perform annual periodic review of written energy control procedures.

### 6.3 Employee Responsibilities

- Authorized and affected employees are expected to comply with the lockout/tagout policy and procedures.
- When employees are issued personal safety locks, keys, or tags, they will be expected to take care of them; keep them in their possession and not loan them to other employees; and notify their supervisor if the lock, key, or tag becomes damaged or lost.
- Employees should consult with their supervisor whenever there are any questions regarding their personal protection during maintenance, service, or routine operations.

### 6.4 Outside Contractors

The project or contract manager will notify outside contractors whose employees are engaged in activities that require lockout/tagout of the policy and procedures used within the University. All contractors must abide by the University's lockout/tagout procedures as a condition of their contract.

Outside contractors desiring to use their own locks or tags must first obtain approval from the Maintenance Manager and provide ABC MIDWEST SOLUTIONS, LLC with a master key for emergency purposes.





## 7.0 General Rules:

- Safety locks are for the personal protection of the employee and are only to be used for locking out equipment. Employees are not allowed to “loan” their locks to other employees.
- No two-safety lock configurations will be the same. Each key will fit only one lock and only one key will be issued to each employee. ABC MIDWEST SOLUTIONS, LLC locksmith will have a master list of key numbers and will keep one extra key to each lock.
- Supervisory locks will be used to lockout equipment for an extended period of time. The supervisor will retain all supervisory locks and keys.
- Only the employee who applies a safety lock may remove it. If the employee is not available to remove a lock, specific procedures in Section 12.0 (below) must be followed.

## 8.0 Placement of Tags or Locks

Each lock or tag must be identified with:

- The name of the person performing the work
- A description of the work
- The date
- The department performing the work.

If more than one person is working on the equipment, each worker must place his or her own lock and tag on the control or switch. A multiple user hasp may be used in cases where more than one person is working on the equipment. In such places where multiple locks are not possible, each employee should affix his/her own tag to the single lock that is in place. If the control or switch is always in sight, the worker may choose to use a tag on the control or switch.

### 1. 8.1 Verifying

Before starting work, press the “on” switch to make sure that the equipment cannot be started, set in motion or energized by alternate power sources or stored energy. Where there is potential exposure to electrical wiring, test all poles or lines of the power source to ensure that they are all disconnected.



## 8.2 Removal

When the job is finished, each worker must remove his or her lock and tag. One worker must not remove the lock or tag of another worker.

In some circumstances supervisors may need to remove or grant permission to remove a worker's lock or tag. This may only be done after a thorough inspection has been made of the area, by the supervisor, to assure that no person will be exposed to dangers as a result of activating the system.

Per Sections 11 & 12, the supervisor must insure that the person whose name is on the lock or tag is contacted and notified that their lock or tag is being or has been removed.

Each padlock will have only one key, which is used by the employee, and a master, which must be retained by the supervisor. If a key is lost, report it immediately to the supervisor.

## 9.0 Locking and Tagging Equipment or Machines

The following procedures must be followed when locking and tagging equipment to work on.

- The authorized employee will notify affected employees that equipment is to be locked out. The equipment under repair is to be locked and tagged by ALL workers performing service on the equipment. Each authorized employee will use his/her own personal lock on the equipment. The lock may be removed ONLY by the authorized employee who placed it on the equipment, except in special circumstances as described in this chapter.
- All electric power to the equipment must be turned OFF and locked OFF with the padlock. Energy must be isolated so that it is not possible to inadvertently re-energize the equipment.
- A red tag reading "Danger: Do Not Operate" must be attached, initialed, and dated by the authorized employee.
- Before work is started, all pneumatic, hydraulic, or other fluid lines in the machine must be checked for stored energy. All pressure must be vented or safely isolated from the area where work is to be done.
- Contents of line accumulators or tanks must be drained as necessary. Valves must be locked in either the open or closed position as the situation requires preventing a buildup of pressure.



## ABC Midwest Solutions 2022 Safety Program

- Any mechanisms under spring tension or compression must be blocked, clamped, or chained in position if the stored energy cannot be safely released.
- Any suspended mechanisms or parts which might drop or cycle through a lower position must be moved to a safe position, or if necessary blocked, clamped or chained in place.
- All moving parts must be at rest and the start button must be activated to assure that the machine is in a zero mechanical state before starting work. Operating controls must be returned to the OFF position after the isolation of the equipment is verified.
- Equipment with power panels at public locations must be locked out or positively disabled at two separate locations.
- Equipment operated by a single electrical source will be untagged and a TAGOUT sign attached to the ABC Midwest Solutions, LLC, unless the ABC Midwest Solutions, LLC is under the exclusive control of the employee or constant sight of the employee.

### 10.0 Ongoing Repairs

- If repairs must continue beyond the authorized employee's shift, he/she must confer with his/her supervisor to determine whether another authorized employee will continue repairs.
- If another authorized employee will be continuing the repair, then the status of the repair must be forwarded to that employee. The initial lock and tag must be removed in the presence of the replacement employee, and the replacement employee must install his/her own lock and tag before continuing with the repair.
- If repairs will be suspended in the time between shifts, the employee must remove his/her lock and tag in the presence of his/her supervisor and the supervisor must install a supervisory lock and tag

### 11.0 Removing Locks and Tags

Locks and tags may ONLY be removed by the authorized employee who initially put them in place except as noted in this chapter. Before the last lock/tag is removed from machinery or equipment, all of the following conditions that apply must be completed.

- All guards must be installed.
- All exposed electrical wiring must be covered.



## ABC Midwest Solutions 2022 Safety Program

- All open pipes must be closed and properly connected.
- Verify that all controls are in neutral position.
- The authorized employee must insure that systems and equipment are safe to operate and that all nonessential items have been removed from the work area.

The authorized employee must check to insure that all other employees have been safely positioned or removed from the area.

The authorized employee must notify effected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

Remove the lock/tag.

### **12.0 Supervisory Removal of Locks and Tags**

In very unusual cases, a supervisor may remove a lock/tag installed by an authorized employee. The supervisor must verify the following:

- The authorized employee who installed the lock/tag is not at ABC MIDWEST SOLUTIONS, LLC at that time.
- All reasonable efforts have been made to contact the authorized employee and inform him/her that the lock/tag has been removed.
- The authorized employee is informed that the lock/tag has been removed before he/she resumes work at ABC MIDWEST SOLUTIONS, LLC.
- All other criteria of section 11.0 Removing Locks and Tags have been met.

### **13.0 Procedures for Locked/Tagged Equipment or Machines**

If another employee or person at ABC MIDWEST SOLUTIONS, LLC comes across a machine or equipment that has been locked/tagged out and that machine or equipment must be operated, the authorized employee who placed the lock/tag must be contacted.

If the locked/tagged equipment must be operated during normal working hours, notify Facilities Management at the home office. Give the location of the equipment and the initials of the individual who signed the tag.

If the locked/tagged equipment must be operated outside of normal working hours, notify Campus Safety & Information at the home office. CSIN will contact the maintenance manager. Give the location of the equipment and the initials of the individual who signed the tag.



ABC Midwest Solutions 2022 Safety Program

Under no circumstances may any ABC MIDWEST SOLUTIONS, LLC staff other than the authorized employee who placed the lock/tag or his/her supervisor (Section 12.0) remove any locks or tags.

Failure to follow these rules may result in disciplinary action.



## 10. Office Safety Procedures

### 1.0 Introduction

Office safety is like safety anywhere else. It doesn't just automatically happen. It is the result of the individual effort of everyone concerned.

Many mishaps in offices nationwide stem from the fact that these areas are frequently considered non-hazardous and therefore safety is often not emphasized. The following are some suggestions to help reduce some of the hazards found in these areas.

### 2.0 Some General Tips

- Come to work rested. Fatigue is a frequent factor in mishaps. It can cause people to lose concentration and become distracted. Build adequate breaks into your daily routine.
- Think about safety and follow safety rules. Before doing something, ask yourself whether what you are about to do is going to be safe for yourself or others. In this way, safe work habits can develop quickly.
- Avoid practical jokes that may cause injury. These have no place in the work area.
- Know your emergency procedures. Please refer to the Emergency Procedures Handbook. The emergency number is 911.
- Contact 911 to report a hazardous spill (such as a chemical).

### 3.0 Office Ergonomics and Lifting

"Ergonomics" is the study of how people interact with their work environment. When workplace design is fitted to the needs and capabilities of employees, comfort and productivity are at their highest. Every individual and working situation is different, and not every factor in the workplace can be changed. Look for ways to increase ergonomic efficiency where possible. Please refer to the section on lifting and ergonomics in this Health & Safety Manual for some general guidelines that you can follow to make your work experience less demanding on the eyes, body, and mind.



## 4.0 Preventing Fall Injuries

- Keep the floor clean. Small or loose objects can cause someone to slip, trip, or fall.
- Use aisles. Avoid taking short cuts between desks where wastebaskets, phone and extension cords or other objects are located.
- Keep file and desk drawers closed.
- Watch your step. Don't read while walking, nor obstruct your vision with tall loads. Report burned out lights promptly to Facilities Management via work order or by calling the home office.
- Wipe up wet spots. Carry beverages in covered containers or on trays to help prevent spills.
- Use proper foot protection. Wear shoes that protect from cuts, crushing, liquids, or slipping. In offices, lower heels are less fatiguing. During winter – icy conditions wear slip resistant rubber soled shoes while walking from and to your vehicle. Then switch to appropriate office shoe.
- Keep chairs solidly on the floor. Tilting back in chairs can cause injuries.
- Avoid stringing electrical cords across walkways. If a cord must be positioned across a walkway, it should be placed within a cord conduit that protects the cord and limits the trip hazard.

## 5.0 Preventing Filing and Storage Accidents

- Avoid overloading top drawers. Overloading top drawers can bring the file cabinet down on you. Too much weight near the front of a drawer will also cause tipping of file cabinet.
- Close one drawer before opening another. Prevent bangs on the head or unexpected trips.
- Close drawer gently using handles. Fingers can get pinched when you use top or sides of drawers.
- Don't struggle with stuck drawers or doors. That is an easy way to cause back injury or bring everything down on you. If a drawer or door is stuck, get assistance and have it repaired.
- Anchor bookshelves and file cabinets to the wall. This will prevent shelves from falling on you or blocking your exit in case of an earthquake.



## ABC Midwest Solutions 2022 Safety Program

- Storage of materials > 6' above ground equipped with earthquake protection.

### 6.0 Preventing Machine Accidents

- Read instructions or listen to them carefully. Never use machines you do not know how to operate.
- Be sure mechanical guards are in place every time you use a machine. If a machine guard has been temporarily removed, be sure it is replaced before using the machine. Watch your hands and use caution.
- Unplug machines. Do so before making adjustments, applying flammable solutions (only when appropriate) Turn off equipment whenever leaving a machine, even for a minute.
- Be alert for electrical hazards. Electric current can cause injury or death or fire. If a machine overheats, smokes, or sparks, or you feel even a slight shock, unplug it and have it repaired. Contact Facilities Management directly at x7380 or by creating a work order ticket.
- Check machine position before use. Computers, fax machines, photocopiers, and adding machines should be firmly on the working surface. Heavy or expensive equipment should be anchored to the surface for earthquake stability.
- Keep liquids away from electrical machines, keyboards, or cords. Electricity and water do not mix.
- Electric fans. Do not remove protective guards from fans. Ensure that fan guards have openings no larger than one-half inch. Do not place fans in aisles or doorways.

### 7.0 Preventing Supply Room Accidents

- Use good housekeeping. Cleanliness makes work easier and conditions safer. Keep aisles clear and shelves orderly with materials secure. Materials stored on shelves may not be higher than 2 feet below the ceiling.
- Store chemicals and flammables. Carefully label them and seal in approved containers (see the Hazard Communication chapter). Training must be provided to those handling hazardous materials.
- Dispose of shipping and packing materials. Loose debris can cause falls and is a fire hazard.





## ABC Midwest Solutions 2022 Safety Program

- Open packages correctly. The safest way to open a package is to inspect for sharp projections and rough edges. Cut away from body using the right tool for the job.
- Use a ladder or stepstool. Do not rely on chairs or shelves for support. Use a ladder that is sturdy, with the feet set firmly on the ground. Face the ladder when climbing, avoid stretching beyond the ladder, get off the ladder to move it, and avoid carrying more than you can safely handle.

### 8.0 Preventing Cuts and Punctures

- Utility knives & other cutting instruments, use care with cutting tools. In most cases, cutting away from your hand or body is the preferred method.
- Sharps or pointed objects, store them separately in a drawer where they are visible when searching for the item.
- Paper cutters, maintain the blade and cutter. Guards must be installed during use. Do not cut too many sheets at one time.
- Broken glass, sweep up pieces instead of picking them up by hand. Glass splinters can be picked up with a damp paper towel.
- Bloodborne Pathogen safety concerns: if broken glass, clothing, or objects have blood on them, contact 911 to report a blood spill.

### 9.0 Fire Prevention

- Keep aisle, pathways and exits clear.
- Know the location of fire exits and designated assembly areas.
- No smoking is permitted inside or within 50 feet of buildings.
- Smoking is not permitted where any flammable liquid is being used.
- Do not overload outlets and extension cords. Contact Facilities Management or Computing and Telecommunications for help in identifying whether a circuit is overloaded. Extension cords may only be used for temporary purposes. Permanent wiring must be installed for long term needs.
- Do not “daisy chain” power strips. Power strips may not be connected in series to form a longer power strip. Purchase and use the power strip length needed for the job.
- Identify electrical cord insulation damage. Inspect and report any damage to switches, fixtures, and wires. Do not pinch wires under or around furniture.



## ABC Midwest Solutions 2022 Safety Program

- Use three-prong electrical grounded equipment to provide protection from shock.
- Space heaters obtained from Facilities Management may be used with caution. Three (3) feet of clearance must be maintained on all sides of the heater. Individual space heater must have an auto-turn off feature if tipped or overheated.
- Small appliances: toasters; microwaves; and coffee pots allowed only in centralized approved break areas.
- Materials stored on shelves may not be stored higher than 24" below the ceiling in buildings without a fire sprinkler system and 18" in buildings with a fire sprinkler system.
- Know where fire extinguishers are located and know how to use them! Take a fire safety class from Environmental Health & Safety.

### 10.0 Security Issues

- Use the ABC MIDWEST SOLUTIONS, LLC Safety escort service when working late or traversing isolated areas.
- Prepare an alert system, such as a specific word, that notifies co-workers of a potentially threatening situation.
- Develop internal office response protocols for potentially threatening situations. Call 911 to report such situations.
- Lock your office door when not present.
- Use caution when sorting or opening mail. Look for suspicious packages and letters. If you find a suspicious package or letter, please contact 911. The following are mail characteristics of a suspicious nature:
  - Excessive postage
  - Handwritten or poorly typed addresses
  - Incorrect titles and/or title, but no name
  - Misspellings of common words
  - Oily stains, discolorations, or odor
  - No return address
  - Excessive weight



#### ABC Midwest Solutions 2022 Safety Program

- Lopsided or uneven envelope
- Protruding wires or aluminum foil
- Excessive security material such as masking tape, string, etc.
- Visual distractions
- Ticking sound
- Marked with restrictive endorsements, such as “Personal” or “Confidential”
- Shows a city or state in the postmark that does not match the return address.



## **11. Personal Protection Program (PPE)**

### **1.0 Introduction**

ABC MIDWEST SOLUTIONS, LLC will provide most required personal protective equipment (PPE). The employee may be required to provide PPE that is of a personal nature and that may be worn off the job, such as slip resistant footwear. An employee who comes to work without their PPE may be sent home on their own time to retrieve the equipment.

### **2.0 Hazard Assessment**

Each supervisor is responsible for conducting regular hazard assessments. The process involves looking for and identifying potential hazards in the workplace to determine whether PPE is needed and what type. The Environmental Health & Safety Manager is available to assist in this process.

PPE alone is not to be relied on to provide protection for employees. PPE may be used after all other reasonable means of reducing hazards have been explored. Take active steps to eliminate all identified hazards through the use of other methods, materials, processes or engineering controls. A periodic review of the hazard assessment should be conducted.

The hazard assessment or review must be documented, in writing or electronic form and approved by the Environmental Health & Safety Manager. The hazard assessment must contain the following information:

- Name of the Department
- Name of person certifying that a workplace hazard assessment was done
- Date(s) the workplace hazard assessment was done
- Statement identifying the document as the certification of hazard assessment of PPE for the workplace

Sample evaluation forms can be found in Appendix A.

### **3.0 Selection and Use of PPE**

Following the hazard assessment, appropriate PPE must be selected to protect against injuries or damage from the hazards that could not be otherwise eliminated.



## ABC Midwest Solutions 2022 Safety Program

PPE must meet the most current ANSI (American National Standards Institute) standard. Eye and face protection must meet ANSI Z87.1 – 2003. Head protection must meet ANSI Z89.1 – 2003. Foot protection must meet ANSI Z41 – 1999. Employees exposed to hazards that could injure their hands must use appropriate hand protection (See Section 5.3). Employees wear personal flotation devices (PFD) when they work in areas where the danger of drowning exists. The safety equipment vendor must supply upon your request, written evidence that PPE purchased by ABC Midwest Solutions, LLC meets these ANSI standards.

Before each day's use, employees must carefully inspect PPE, clothing and equipment to make sure they are clean and undamaged. Those items found to be defective must be taken out of service.

### 4.0 Training

Employees must be trained so that each employee knows what PPE is required for the various work areas or tasks that s/he may be assigned. Employees should know

- When PPE is necessary
- What PPE is necessary
- How to put on the equipment correctly
- How to adjust and remove equipment
- The limitations of the PPE
- Proper care, maintenance, lifespan, and disposal of the PPE

The supervisor must keep training records.. Training records should include the name of the employee and the date(s) of the training. The ABC MIDWEST SOLUTIONS, LLC Personal Protective Training List may be used to track employee training. See Appendix B

The supervisor is responsible for assuring compliance with this policy. Retraining may be necessary when an employee does not use the equipment as directed by the manufacturer and according to code requirements.

### 5.0 PPE Standards

#### 1. 5.1 Occupational Head Protection

Employees must wear appropriate head protection whenever exposed to hazards that could cause head injuries, such as, from flying, propelled, or falling objects or



## ABC Midwest Solutions 2022 Safety Program

materials. Head protection must meet ANSI Z89.1 Caps with metal buttons or metal visors may not be worn around electrical hazards.

Persons working around machinery or in locations that present a hair-catching hazard or fire hazard must wear caps or another type of head covering that completely covers the hair.

- Note 1: The following is the Wisconsin State definition of hair that is considered hazardous:
  - Hair is as long as the radius of pressure rolls with exposed in-running nip points. Hair is twice as long as the circumference of exposed revolving shafts or tools in fixed machines.

Note 2: Employees must wear a hair covering of solid material when the employee is exposed to an ignition source and may run into an area containing class 1 flammable liquids, such as ether, benzene, or combustible atmospheres if their hair is on fire.

### 5.2 Eye and Face Protection

The Wisconsin Industrial Safety & Health Act standard requires employees to use appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids, or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

Further, each affected employee must use eye protection that provides side protection when there is a hazard from flying objects. Employees who wear prescription glasses will be provided with safety eye wear that fits over the glasses. Employees may, at their own expense, opt to purchase their own prescription safety glasses that meet ANSI standards.

- Proper eye protection must be worn whenever there is a reasonable possibility that an eye injury could occur.
- Suitable eye protection may include safety glasses, goggles, face shields or approved dark glasses. The degree and type of hazard indicates the type of eye protection.
- Eye protection is required in operations involving welding, drilling, chipping, hammering, sawing, chemical handling, weed-whacking, or other hazardous equipment and operations.



### **5.3 Hand Protection**

Employees must use appropriate hand protection when their hands are exposed to hazards such as those from skin absorption of harmful substances, cuts or lacerations, abrasions, punctures, chemical burns, temperature extremes, harmful radiation or other material handling hazards. Make sure when choosing hand protection, you consider how well the hand protection performs relative to the: Task; Conditions present; Duration of use; Hazards and Potential hazards. Hands must be kept out of the immediate cutting area or point of operation of any cutting type of equipment, such as the paper cutter.

### **5.4 Foot Protection**

The State of Wisconsin requires employees to wear “substantial” footwear made of leather or other equally firm material whenever there is a danger of injury to the feet through falling or moving objects, or from burning, cutting, penetration, electrical, or like hazard. Footwear must meet ANSI standard Z41-1999 specifications.

### **5.5 Hearing Protection**

Hearing protection must be worn whenever an employee is exposed to high or long duration noise levels such as grinders, gas-powered machines, or air tools. Employees who are exposed to sound levels that exceed 85 dB time weighted average (TWA) will be included in our formal hearing protection program. Please refer to the Hearing Conservation section.

### **5.6 Respiratory Protection**

Respiratory protection must be worn whenever there is an inhalation risk. Before using a respirator, you must pass a medical evaluation and fit test. Please refer to the Respiratory Protection section for more information or contact the Environmental Health & Safety Manager.

## **6.0 Clothing and Jewelry**

Clean clothing sufficient to protect against the hazards of the operations being performed must be used. Loose shirtsleeves, coverall sleeves or rings, earrings, wristwatches, and other jewelry must not be worn when working with power equipment or machinery.

Long sleeves and pants must be worn when there is the risk of chemical splash or flying objects. Cooks must wear loose, natural fabric clothing, such as cotton, so that hot water or grease spills will not be as likely to burn the skin as it would with clingy materials and styles.



## 7.0 Illumination of Work

Whenever natural light is insufficient to illuminate work operations, artificial illumination will be provided to enable the work to be performed safely.





## 12 Powered Industrial Trucks

### 1.0 Introduction

This section applies to fire protection, design, and use of powered industrial trucks that use electric motors or internal combustion engines:

- Fork trucks
- Forklifts
- Tractors
- Platform lift trucks
- Motorized hand trucks.

### 2.0 Operator Selection, Qualifications, and Training

Not every worker should be allowed to operate a powered industrial truck. It is only those employees who are willing and able to be trained that should be permitted to receive Powered Industrial Truck training. The following are guidelines to consider when supervisors select employees who will be allowed to receive the required training and then go on to be certified as an approved Powered Industrial Truck operator.

#### 1. 2.1 Authorization

Only trained and authorized employees shall be permitted to operate a powered industrial truck PIT. The procedure for becoming an operator is as follows:

- Your supervisor must request authorization from the Facilities Management Maintenance Manager to use equipment maintained by Facilities Management. The Maintenance Manager will evaluate the request based on:
  - A demonstrated need throughout the year. An operator must use the PIT at least six (6) times per year on average to qualify.
  - The supervisor's confidence in the employee's ability to operate the equipment safely.
- If approved, the Maintenance Manager will inform the Environmental Health & Safety Manager who will assist the supervisor to schedule operator training.



## ABC Midwest Solutions 2022 Safety Program

- Lastly, you must attend training and demonstrate operator competence.

### 2.2 Operator Qualifications

The supervisor must verify that each potential operator of a powered industrial truck is capable of performing all the duties that are required of the job.

Potential operators may be considered “qualified” to operate a powered industrial truck once they have:

- Received training as defined below, and
- Have been observed operating the truck they will be using by a qualified person
- The operator’s performance has been evaluated as to their ability to perform required operations competently.

Having satisfied these requirements, the candidate will be certified by the University as a powered industrial truck operator.

### 2.3 Training

The content of training may be catered to the operator based on the operator’s prior knowledge and skill, the type of truck that will be used by the operator, and the specific workplace hazards to which the operator will be exposed.

An operator must have demonstrated knowledge or training in the following topics

**Truck-related topics, including:**

- Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate
- Differences between the truck and the automobile
- Truck controls and instrumentation: where they are located, what they do, and how they work
- Engine or motor operation
- Steering and maneuvering
- Visibility (including restrictions due to loading)
- Fork and attachment adaptation, operation, and use limitations



## ABC Midwest Solutions 2022 Safety Program

- Vehicle lifting capacity
- Vehicle surface stability
- Any vehicle inspection and maintenance that the operator will be required to perform (See Appendix A for inspection form)
- Refueling and/or charging and recharging of batteries
- Operating limitations: Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate

### Workplace-related topics:

- Surface conditions where the vehicle will be operated
- Composition of loads to be carried and load stability
- Load manipulation, stacking, and un-stacking
- Pedestrian traffic in areas where the vehicle will be operated
- Narrow aisles and other restricted places where the vehicle will be operated
- Hazardous (classified) locations where the vehicle will be operated
- Ramps and other sloped surfaces that could affect the vehicle's stability
- Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust
- Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation

### 2.4 Refresher Training

- Refresher training is required when: The operator is involved in an accident or a near-miss incident
- The operator has been observed operating the vehicle in an unsafe manner
- The operator has been determined during an evaluation to need additional training



## ABC Midwest Solutions 2022 Safety Program

- There are changes in the workplace that could affect safe operation of the truck
- The operator is assigned to operate a different type of truck

Note: If an employee is found to be negligent or unsafe in the care and operation of the, then either the Facilities Maintenance Manager or the Environmental Health & Safety Manager may revoke the privilege of using the equipment.

### 2.5 Three Year Evaluation

The Environmental Health & Safety Manager is responsible for arranging an evaluation of each operator's performance or refresher training at least once every three years as required by ABC MIDWEST SOLUTIONS, LLC policies and procedures.

## 3.0 Powered Industrial Truck Operation Guidelines

All operators must be aware of these guidelines and follow them. **Operating Near People**

- Powered Industrial Trucks must not be driven up to anyone standing in front of a bench or other fixed object.
- No person is permitted to stand or pass under the elevated portion of any Powered Industrial Truck, whether loaded or empty.
- Authorized personnel may ride on a Powered Industrial Truck, but only if there is a seat with a belt for them to ride.
- Arms or legs must not come between the uprights of the mast or outside the running lines of the Powered Industrial Truck.

### 1. 3.2 Operating as an Elevated Work Platform

When using, as an elevated work platform make sure the following requirements are met:

- The lift cage must be securely attached to the forks.
- The hydraulic system must be safe and in proper operating condition.
- A safety strap should be used, or the control lever locked, to prevent the boom from tilting.
- The operator must stay with the Powered Industrial Truck while workers are on the platform.



### ABC Midwest Solutions 2022 Safety Program

- The operator must be seated in a normal operating position while raising or lowering the platform.
- The truck must not travel from point to point while workers are on the platform; inching or maneuvering at very slow speed is permitted.
- Make sure the area between the workers and the mast is adequately guarded to prevent contact with chains or other shear/pinch points.

#### 3.3 Leaving the Powered Industrial Truck Unattended

When leaving a Powered Industrial Truck unattended, fully lower the forks, neutralize controls, shut off power, and set brakes. Wheels must be blocked when the truck is parked on an incline.

A Powered Industrial Truck is considered unattended when:

- The operator is 25 feet or more away from the vehicle.
- The operator leaves the vehicle and it is not in view.

Whenever the operator is off the truck but within 25 feet, with the truck still in view, the forks must be fully lowered, controls neutralized, and the brakes set to prevent movement.

#### 3.4 When the View is Obstructed

- Drive backwards when the load obstructs the view.
- When approaching a blind corner, an aisle, or an area of pedestrian traffic, sound the horn as a courtesy or warning.

#### 3.5 Speed, Height, Stacking & Clearance

- It is the responsibility of the operator to maintain a safe speed at all times.
- Must not be driven with the load in a raised position. The load must be kept close to the ground.
- Pallets placed onto shelving must be firmly supported by both rails. Shelving members and supports must be checked regularly for strength and stability. The load must not exceed the safe maximum storage capacity of the shelving.
- Always make sure there is sufficient headroom to drive under overhead installations, lights, pipes, sprinkler system, etc.



## ABC Midwest Solutions 2022 Safety Program

- Fire aisles, access to stairways, and fire equipment must be kept clear.

### 3.6 Loading Trucks, Trailers...etc.

Brakes must be set and wheel blocks in place to prevent movement of trucks or trailers while loading or unloading. It is the responsibility of the operator to verify that the vehicle has been properly secured from movement before driving onto the vehicle to load or unload it. Fixed jacks are to be used to support a semi trailer during loading or unloading when the trailer is not coupled to a tractor. The flooring of trucks, trailers, and railroad cars must be checked for breaks and weakness before driving onto them.

### 3.7 Load Limits

No person is permitted to alter a Powered Industrial Truck to provide additional ballast or counterweight unless it is done in complete conformity to the manufacturer's recommendations. If that cannot be done and the load is too heavy, it must be divided into loads small enough to lift safely.

### 3.8 Operation Powered Industrial Truck

- If at any time a Powered Industrial Truck (PIT) is found to be in need of repair, defective, or in any way unsafe, the PIT must be taken out of service until it has been restored to safe operating condition.
- Fuel tanks may not be filled while the engine is running. Spillage must be avoided.
- Oil or fuel spills must be carefully cleaned-up with compatible absorbent or completely evaporated and the fuel tank cap must be replaced before restarting the engine.
- No PIT will be operated with a leak in the fuel system.
- Open flames shall not be used for checking electrolyte level in storage batteries or gasoline level in fuel tanks.

### 3.9 Lighting for Operating Areas

- Controlled lighting of adequate intensity should be provided in operating areas.
- Where general lighting is less than two lumens per square foot, auxiliary directional lighting must be provided on the truck.

### 3.10 Control of Noxious Gases and Fumes



#### ABC Midwest Solutions 2022 Safety Program

- Concentration levels of carbon monoxide gas created by PIT operations must not exceed the levels Wis State Statues.
- Questions concerning concentration and methods of sampling to ascertain the conditions must be referred to the ABC MIDWEST SOLUTIONS, LLC manager .

## 4.0 Fuels - Hazard Communication

### 1. 4.1 Liquid Petroleum Gas

- Liquid petroleum gas or LPG is commonly known as propane. Propane is a highly flammable gas. All sources of ignition must be eliminated from the fueling and use area to prevent fire or explosion. Explosive vapors may also travel and ignite at remote locations.
- The ignition temperature of LPG is 874°F. To provide a frame of reference, a cigarette burns between 550 and 1350°F, depending on the draft. An ABC dry chemical fire extinguisher may be used to put out small fires after the fuel source has been controlled.
- In its liquid form, LPG can cause frostbite. Gloves and goggles or safety glasses must be worn when fueling with LPG.
- LPG will replace oxygen in the air. In confined locations, it acts as an asphyxiate by reducing the amount of oxygen available to breath effectively.
- The MSDS for LPG must be maintained in a location that is accessible by all exposed employees.

### 4.2 Gasoline

- In specific PIT's unleaded gasoline may be used as an alternative to propane. Gasoline is an extremely flammable liquid and vapor, though not as flammable as LPG. Gasoline vapors may travel and ignite at remote locations. An ABC dry chemical fire extinguisher may be used to extinguish small fires after eliminating the fuel source.
- Gasoline is also an extreme health hazard. Ingestion of gasoline may be fatal. Mouth siphoning of gasoline is not permitted. Liquid contact with skin or mucous membranes may cause irritation.
- Overexposure by inhalation and absorption of gasoline may cause damage to the brain, central nervous system, heart, lungs, liver and kidneys. Some compounds in gasoline are known to cause cancer.



#### ABC Midwest Solutions 2022 Safety Program

- Gasoline replaces oxygen in confined spaces creating an asphyxiation hazard.
- When misting or splashing of gasoline is expected based on the method of use, then goggles or safety glasses and neoprene gloves must be worn as a safety precaution.
- The MSDS for unleaded gasoline must be maintained in a location that is accessible by all exposed employees.





## 13 Respiratory Protection Program

### Respiratory Protection Program

#### Introduction

The purpose of this respiratory program is to provide and maintain a safe and healthful work place for all employees who work in environments with airborne contaminants. This section establishes procedures and provides instructions in the selection, use and care of respiratory protective equipment. Wisconsin State Labor & Industries respiratory protection rules can be found [here](#).

ABC Midwest Solutions, LLC (ABC MIDWEST SOLUTIONS, LLC) recognizes that respirators, in addition to safe distancing and other prevention measures, can help prevent the spread of the coronavirus (also called SARS-CoV-2) at work. This written program is necessary to guide ABC MIDWEST SOLUTIONS, LLC's respirator selection, medical evaluation, fit testing, and use processes so that respirators provide reliable protection.

Our respirator program administrator is the ABC MIDWEST SOLUTIONS, LLC Environmental Health & Safety (EH&S) Manager

Our administrator's duties are to:

- oversee the development and implementation of this respiratory protection program
- ensure respirator use is monitored
- evaluate the program regularly to make sure procedures are appropriate and continue to provide adequate protection when job conditions change



## 14. Scaffold Safety

### Scaffold Safety Scope

This chapter applies to suspended and supported scaffolds, including their supporting structures and anchorage points.

**Exemption:** This chapter doesn't apply to:

- Manually propelled elevating work platforms
- Self-propelled elevating work platforms
- Boom-supported elevating work platforms
- Aerial lift
- Crane or derrick suspended personnel platforms
- Personnel platforms supported by powered industrial trucks (PITs).

**Reference:**

- Additional requirements for the following types of platforms are found in the General Safety and Health Standards, Go to the following sections:
  - For elevating work platforms and aerial lifts, go to Elevating Work Platforms,
  - For crane or derrick suspended personnel platforms, go to the State Statues
  - For personnel platforms supported by powered industrial trucks (PITs), go to

**Definition:**

- A **scaffold** is a temporary elevated platform, including its supporting structure and anchorage points, used for supporting employees or materials.
- A **suspended scaffold** is one or more platforms suspended from an overhead structure by ropes or other nonrigid means.
- A **supported scaffold** is one or more platforms supported by rigid means such as outrigger beams, brackets, poles, legs, uprights, posts, or frames.



## General Requirements for Scaffolds

### 1. Make sure scaffolds are properly designed and constructed

- Make sure scaffolds are: Designed by a qualified person and Constructed according to that design.
- Prohibit the use of shore and lean-to scaffolds
- **Definition:** A **qualified person** is one who has demonstrated the ability to solve problems related to the subject matter, work, or project. This can be done by having either:
  - A recognized degree, certificate, or professional standing; or
  - Extensive knowledge, training, and experience.

### 2. Make sure scaffolds are erected, moved, altered, or dismantled by appropriate persons

- Make sure scaffolds are erected, moved, altered, or dismantled only when the work is:
  - Supervised and directed by a competent person qualified in scaffold erections, moving, dismantling or alteration; and
  - Done by experienced and trained employees selected by the competent person.

**Definition:** A **competent person** is someone who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees and has the authority to take prompt corrective measures to eliminate them.

### 3. Maintain structural integrity when intermixing scaffold components

- Make sure intermixed scaffold components: Fit together without force and maintain the scaffold's structural integrity.
- Make sure a qualified person determines that modifying components in order to intermix them will result in a structurally sound scaffold.
- Make sure scaffold components made of different metals aren't used together.



ABC Midwest Solutions 2022 Safety Program

- **Exemption:** Different types of metals may be used together if a competent person determines that galvanic action won't reduce the strength of any component to less than the minimum strength required.

**Reference:** The minimum strength requirements are found in the following sections:

- Suspended Scaffolds, State Code
- Supported Scaffolds, State Code

4. **Make sure platforms are properly planked or decked** Fully plank or deck each platform between the front uprights and the guardrail supports on all working levels of a scaffold so that there's no more than one inch (2.5 cm):

- 
- Between adjacent units, and between the platform and the uprights.
- **Exemption:** There may be more than one inch between platform units if all of the following are met:
  - You can demonstrate that a wider space is necessary, such as to fit around uprights when side brackets are used to extend the platform width
  - The platform is planked or decked as fully as possible
  - The open space between the platform and the guardrail supports is 9-1/2 inches (24.1 cm) or less.

Platforms used solely as walkways or only by employees erecting or dismantling scaffolds, don't have to be fully decked or planked if:

- The planking provided makes for safe working conditions, and
- Employees on those platforms are protected from falling.

**Fall protection requirements for employees**

**Are located in the following chapters**

On walkways within scaffolds

Wisconsin State Statue, **Scaffolds**



ABC Midwest Solutions 2022 Safety Program

**Fall protection requirements for employees**

**Are located in the following chapters**

Erecting or dismantling supported scaffolds

Wisconsin Statutes, **Scaffolds**

Erecting or dismantling suspended scaffolds in general industry

Wisconsin Statutes, **General Safety and Health Standards**

Erecting or dismantling suspended scaffolds in construction work

Wisconsin Statutes, **Safety Standards for Construction Work**

Make sure wood platforms aren't covered with an opaque finish

**Exemption:** Platform edges may be covered or marked for identification.

**Note:** Platforms may be coated periodically with wood preservatives, fire-retardant finishes, or slip-resistant finishes if the coating doesn't obscure the top or bottom wood surfaces.

**Make sure platforms meet minimum width requirements**

- Make sure scaffold platforms meet the minimum width requirements of Table 1.

Types of scaffold	Minimum platform width required
Ladder jack scaffold Pump jack scaffold Roof bracket scaffold Top plate bracket scaffold	12 inches (20 cm)
Boatswain's chair	No minimum width



## Types of scaffold

## Minimum platform width required

All other scaffolds

18 inches (46 cm)

**Exemption:**

Platforms and walkways may be less than 18 inches (46 cm) wide if all of the following are met:

You can demonstrate that the area is so narrow that the platform or walkway can't be at least 18 inches (46 cm) wide

The platform or walkway is as wide as feasible

Employees on those platforms or walkways are protected from falling by using guardrails or personal fall arrest systems

- **Meet these requirements when using shorter platforms to create a longer platform**

- When platforms are overlapped to create a longer platform, that:
  - The overlap is over a support; and
  - The platforms are either:
    0. Overlapped by at least 12 inches (30 cm); or
    1. Are nailed together or otherwise prevented from moving.

When platforms are butted together to create a longer platform, that each abutted platform end rests on a separate support surface.

- **Note:**

- Platforms may butt together on a common support member if the member is designed to support abutting platforms, such as either:
  - A "T" section; or
  - Hook-on platforms designed to rest on common supports

**Lay platform planks properly when the platform changes direction**



## ABC Midwest Solutions 2022 Safety Program

Do the following whenever platforms overlap to change direction: First lay the platform that rests on a bearer at an angle other than a right angle then lay the platform that's perpendicular to the bearer.

### **Stabilize the ends of platforms**

- Make sure each end of a platform:
  - Is cleated or restrained by hooks or equivalent means; or
  - Extends over the centerline of its support at least 6 inches (15 cm).
- Make sure the cantilevered portion of a platform meets at least one of the following:
  - Is designed and installed to support employees or material without tipping
  - Has guardrails which block employee access to the cantilevered end
  - Extends over its support not more than:
    - 12 inches (30 cm) if the platform length is 10 feet or less, or
    - 18 inches (46 cm) if the platform length is greater than 10 feet. Note: The cantilevered portion of a platform is the portion that isn't supported on one end.

### **Keep platform sag within acceptable limits**

Make sure a loaded platform doesn't sag more than 1/60 of the span.

### **Provide safe access to scaffolds**

- Provide scaffold platforms more than 2 feet (0.6 m) above or below a point of access with at least one of the following means of access:
  - Portable, hook-on, or attachable ladder
  - Stairway-type ladder
  - Ladder stand
  - Stair tower (scaffold stairway or tower)
  - Ramp
  - Walkway



#### ABC Midwest Solutions 2022 Safety Program

- Integral prefabricated scaffold access
- Direct access from another scaffold, structure, personnel hoist, or similar surface.  
\* **Cross braces cannot be used as a means of access.**

**Reference:** For requirements about integral prefabricated scaffold access, go to Wisconsin State Statues

#### **Portable, hook-on, and attachable ladders must meet these requirements:**

- Position portable, hook-on, and attachable ladders so they don't tip the scaffold.
- Make sure hook-on and attachable ladders meet all of the following:
  - Specifically designed and used for that type of scaffold
  - Have rungs that are:
    - Uniformly spaced
    - Not more than 16-3/4 inches apart
    - At least 11-1/2 inches (29 cm) long
    - Lined up vertically between rest platforms.
    - Position the bottom rung not more than 24 inches (61 cm) above the scaffold supporting level.
    - Have rest platforms at vertical intervals not greater than 24 feet (7.3m) on supported scaffolds.

#### **Stairway-type ladders must meet these requirements:**

- Make sure stairway-type ladders meet all of the following:
  - Position the bottom step not more than 24 inches (61 cm) above the scaffold supporting level
  - Have rest platforms not more than 12 feet (3.7 m) apart vertically
  - Have slip-resistant surfaces on treads and landings
  - Have steps that:
    - Are at least 16 inches (41 cm) wide; and





#### ABC Midwest Solutions 2022 Safety Program

- Line-up vertically between rest platforms.
- Make sure mobile ladder stands have steps that are at least 11-1/2 inches (30 cm) wide.  
**Definition:** A ladder stand is a mobile, fixed-size, self-supporting ladder consisting of a wide flat tread ladder in the form of stairs.

#### Stair towers must meet these requirements:

- Make sure stair towers (scaffold stairways or towers) meet all of the following:
  - Are positioned so the bottom step isn't more than 24 inches (61 cm) above the scaffold supporting level
  - Are at least 18 inches (45.7 cm) wide between stair rails
  - Have slip-resistant surfaces on treads and landings
  - Are installed at an angle of 40 to 60 degrees from the horizontal.
- Provide a landing platform at least 18 inches (45.7 cm) wide by 18 inches (45.7 cm) long at each level.
- Provide guardrails on the open sides and ends of each landing.  
Reference: For requirements about guardrails, go to Wisconsin State Statutes.

#### Steps must meet all of the following requirements:

- Line-up vertically between rest platforms
- Have uniform tread depth, within 1/4 inch (0.6 cm), for each flight of stairs
- Have uniform riser height, within 1/4 inch (0.6 cm), for each flight of stairs.  
**Note:** Riser height may have larger variations at the top step and bottom step of the entire stair system, but not at the top and bottom steps within each flight of stairs.

#### Stair rails and handrails must meet these requirements:

- Provide a stair rail that meets all of the following on each side of a scaffold stairway:
  - Has a top rail and midrail



#### ABC Midwest Solutions 2022 Safety Program

- Has a top rail that can serve as a handrail if a separate handrail isn't provided
- Is at least 28 inches (71 cm) but not more than 37 inches (94 cm) high.  
Note: Stair rail height is measured from the upper surface of the stair rail to the surface of the tread, in line with the face of the riser at the forward edge of the tread.
- Make sure stair rail systems and handrails have:
  - A surface that prevents employees from:
    - Being injured by punctures or lacerations; or snagging their clothing.
  - Ends that don't create a projection hazard.
- Make sure handrails, and top rails that are used as handrails:
  - Provide an adequate handhold for employees to grasp to avoid falling; and
  - Are at least 3 inches (7.6 cm) from other objects.

#### **Ramps and walkways used to access scaffolds must meet these requirements:**

- Make sure ramps and walkways aren't inclined at a slope steeper than one vertical in 3 horizontal (1:3 or 20 degrees from the horizontal).
- Make sure ramps and walkways that are inclined at a slope steeper than one vertical in 8 horizontal (1:8) have cleats to provide footing which are:
  - Securely fastened to the planks; and
  - Spaced not more than 14 inches (35 cm) apart.  
**Reference:** Ramps and walkways that are 4 feet (1.2 m) or more above a lower level need to have a guardrail system. Those requirements are found in other chapters.
    - For general industry activities, go to: Working Surfaces, Guarding Floors and Wall Openings, Ladders, **Part J-1, in the General Safety and Health Standards,**
    - For construction activities, go to: Floor Openings, Wall Openings, and Stairways, Part K, in the Safety Standards for Construction Work.



**Surfaces used to access scaffolds are close enough to use safely.**

Surface used to provide access to or from a scaffold isn't further from the scaffold than:

- 14 inches (36 cm) horizontally
- 24 inches (61 cm) vertically.

**Inspect scaffolds and scaffold components.**

- - Make sure scaffolds and scaffold components are inspected for visible defects by a competent person:
    - Before each work shift; and
    - After anything occurs that could affect the scaffold's structural integrity

**Damaged or weakened scaffolds must meet minimum strength requirements.**

- Make sure any scaffold or scaffold component that's been damaged or weakened so that it no longer meets the minimum strength requirements of this chapter, is immediately either:
  - Repaired, replaced, or braced to meet the minimum strength requirements; or
  - Removed from service until repaired.  
**Reference:** For information on minimum strength requirements for suspended and supported scaffolds, go to the following sections within this chapter:
    - Make sure suspended scaffolds and suspended components meet these strength requirements.
    - Make sure supported scaffolds and supported components meet these strength requirements.

**Scaffolds are properly loaded**

- Load scaffolds as specified in the:
  - Manufacturer's instructions; or



## ABC Midwest Solutions 2022 Safety Program

- Design of the qualified person.
- Make sure scaffolds and scaffold components don't exceed their maximum intended load or rated load, whichever is less.

### **Protect employees when moving scaffolds.**

- 
- Make sure scaffolds aren't moved horizontally while employees are on them.  
**Exemption:** A scaffold may be moved horizontally with employees on it if the scaffold:
  - Has been specifically designed for such movement by a registered professional engineer; or
  - Is a mobile scaffold that meets the requirements of the section, Meet these requirements when moving mobile scaffolds

### **Increase employee working level height on scaffolds safely**

- Make sure makeshift devices, such as boxes and barrels, aren't used on scaffold platforms to increase the working level height for employees.
- Meet all of the following when using stilts on scaffolds:
  - Use stilts only on large area scaffolds
  - Increase the height of a guardrail system used for fall protection by an amount equal to the height of the stilts being used
- Make sure scaffold platforms where stilts are used are flat and free of:
  - Pits, holes, and obstructions such as debris; and
  - Other tripping or falling hazards.
- Make sure stilts are:
  - Properly maintained; and
  - The original equipment isn't altered without the manufacturer's approval
- Meet all of the following when using ladders on scaffolds:
  - Use ladders only on large area scaffolds



### ABC Midwest Solutions 2022 Safety Program

- Secure the platform units to the scaffold to prevent movement
- Secure the scaffold against the sideways thrust exerted by the ladder if the ladder is placed against a structure that's not part of the scaffold
- Make sure the ladder legs are:
  - Secured to prevent them from slipping or being pushed off the platform; and
  - On the same scaffold platform, or use other means, to stabilize the ladder against uneven platform deflection.

### Control loads being hoisted near scaffolds

Use a tag line or equivalent measures to control loads being hoisted onto or near a scaffold if the load could swing and contact the scaffold.

### Protect employees from energized power lines

Make sure scaffolds are erected, moved, altered, or dismantled so that they, and any conductive material handled on them, are kept at least as far from exposed and energized power lines as shown in Table 2, Minimum Separation Distance from Energized Power Lines.

Voltage	Minimum Separation Distance
Less than 300 volts (insulated lines)	3 feet (0.9 m)
Less than 300 volts (uninsulated lines)	10 feet (3.1 m)
300 volts to 50 kv	10 feet (3.1 m)
More than 50 kv	10 feet (3.1 m) + 0.4 inches (1.0 cm) for each 1 kv over 50 kv <b>Note:</b> You may use alternative minimum separation distance of 2 times the length of the line insulator, but never less than 10 feet (3.1 m).

**Exemption:** Scaffolds and conductive materials handled on scaffolds may be closer to power lines than the minimum separation distance specified in Table 2 if **all** of the following are met:



## ABC Midwest Solutions 2022 Safety Program

- Less clearance is necessary to do the work
- The utility company or electrical system operator has been notified of the need to work closer to the power lines
- The utility company or electrical system operator has done at least one of the following:
  - De-energized the lines
  - Relocated the lines to meet the minimum separation distance requirement
  - Installed protective coverings over the lines to prevent accidental contact

### **Protect employees from weather hazards**

- Prohibit work on or from scaffolds during storms or high winds unless both of the following are met:
  - A competent person has determined that it's safe for employees to be on the scaffold Employees are protected by either:
    - A personal fall arrest system; or
    - Windscreens.
    - Make sure wind screens aren't used unless the scaffold is secured against the anticipated wind forces.

### **Protect employees from slipping and tripping hazards.**

- Make sure debris doesn't accumulate on platforms.
- Prohibit employees from working on scaffolds covered with snow, ice, or other slippery material.  
**Exemption:** Employees may be on scaffolds as necessary to remove the slipping hazard.

### **Provide fall protection for employees on scaffolds.**

- Protect each employee on a scaffold more than 10 ft. (3.1 m) above a lower level, from falling to the lower level, by providing either:
  - A personal fall arrest system; or



ABC Midwest Solutions 2022 Safety Program

- Guardrails.
  - Make sure employees erecting the scaffold install the guardrail system, if required, before the scaffold is used by any other employees.

Fall protection requirements for employees	Are located in the following chapters	In the following sections
On walkways within scaffolds	Wisconsin State Statute - Scaffolds	Wisconsin State Statute
Erecting or dismantling supported scaffolds	Wisconsin State Statute - Scaffolds	Wisconsin State Statute
Erecting or dismantling suspended scaffolds in general industry	Wisconsin State Statute - Scaffolds	See part, Working Surfaces, Guarding Floors and Wall Openings, Ladders <b>and</b> See Part, Powered Platforms
Erecting or dismantling suspended scaffolds in construction work	Wisconsin State Statute - Scaffolds	See Part, Fall Restraint Fall Arrest <b>and</b> Part K, Floor Openings, Wall Openings, and Stairways

**Provide fall protection if a scaffold is too far from the work face.**

- Provide a guardrail system along the front edge of the platform, or have employees use a personal fall arrest system, if the distance from the front edge of the platform to the work face is greater than:
  - 18 inches (46 cm) for scaffolds used for plastering and lathing operations.
  - 14 inches (36 cm) for all other scaffolds

**Provide specific fall protection for specific types of scaffolds.**

- Use a personal fall arrest system to protect employees on the following scaffolds:



## ABC Midwest Solutions 2022 Safety Program

- Boatswain's chair
- Catenary scaffold
- Float scaffold
- Ladder jack scaffold
- Needle beam scaffold.
- Use a personal fall arrest system and a guardrail system to protect employees on:
  - Single-point adjustable suspension scaffolds; and
  - Two-point adjustable suspension scaffolds.
- Protect employees working on a self-contained adjustable scaffold that has the platform:
  - Supported by the frame structure, using a guardrail system with a minimum 200 lb. top rail capacity.
  - Suspended by ropes, using:
    - A guard rail system with a minimum 200 lb. top rail capacity; and
    - A personal fall arrest system.
    - Protect employees on walkways located within a scaffold by using a guardrail system that meets all of the following:
      - Has a minimum 200 lb. top rail capacity
      - Is installed within 9-1/2 inches (24.1 cm) of the walkway
      - Is installed along at least one side of the walkway.

### **Personal fall arrest systems must meet these requirements:**

- Make sure personal fall arrest systems used on scaffolds for general industry activities, meet the requirements of Personal Fall Arrest System, Appendix C, Part 1, WAC 296-24-88050, in Powered Platforms, **Part J-3**, found in General Safety and Health Standards,
- Make sure personal fall arrest systems are attached by a lanyard to one of the following:





## ABC Midwest Solutions 2022 Safety Program

- Vertical lifeline
- Horizontal lifeline
- Appropriate structural member of the scaffold  
**Reference:** Requirements for personal fall arrest systems used on scaffolds for construction activities are in Fall Restraint and Fall Arrest, **Part C-1**, found in Safety Standards for Construction Work.

### **Vertical lifelines used with personal fall arrest systems must meet these requirements:**

- Make sure vertical lifelines are all of the following:
  - Fastened to a fixed, safe point of anchorage
  - Independent of the scaffold
  - Protected from sharp edges and abrasion.
  - **Note:** Safe points of anchorage include structural members of buildings, but do not include:
    - Standpipes, vents, or other piping systems
    - Electrical conduit
    - Outrigger beams
    - Counterweights
- Make sure vertical lifelines, independent support lines, and suspension ropes are not attached to any of the following:
  - Each other
  - The same point of anchorage
  - The same point on the scaffold.
- Make sure vertical lifelines, independent support lines, and suspension ropes don't use the same point of anchorage.
- Make sure independent support lines and suspension ropes aren't attached to a personal fall arrest system.



## ABC Midwest Solutions 2022 Safety Program

- Make sure vertical lifelines aren't used with single-point or two-point adjustable suspension scaffolds that have overhead components such as overhead protection or additional platform levels.

### **Horizontal lifelines used with personal fall arrest systems must meet these requirements:**

- Equip single-point or two-point adjustable suspension scaffolds that use horizontal lifelines or structural members of the scaffold for fall protection with both of the following:
  - Additional independent support lines that are equal in number and equivalent in strength to the suspension ropes
  - Automatic locking devices capable of stopping the scaffold from falling if one or both of the suspension ropes fail.
- Make sure horizontal lifelines are secured to either:
  - Two or more structural members of the scaffold; or
  - Looped around both the suspension ropes and independent support lines above the hoist and brake attached to the end of the scaffold.
- Make sure independent support lines and suspension ropes are not
  - Attached to each other or the same point on the scaffold
  - Attached to or use the same point of anchorage.
- Make sure independent support lines and suspension ropes aren't attached to either:
  - A personal fall arrest system; or
  - The same point on the scaffold as a personal fall arrest system.
- Make sure, if a horizontal lifeline is used where it may become a vertical lifeline, that the device used to connect a lanyard to the horizontal lifeline is capable of locking in both directions on the lifeline.

### **Guardrail systems must meet these requirements:**

- 
- Make sure guardrails, if required, are installed along all open sides and ends of platforms. **Exemption:** For employees doing overhand bricklaying



ABC Midwest Solutions 2022 Safety Program

operations from a supported scaffold, a guardrail isn't required on the side next to the wall. **Definition:** Overhand bricklaying is the process of laying bricks and masonry units so that the surface of the wall is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. It includes mason tending and electrical installation incorporated into the brick wall.

- Make sure the height of the top rail top edge, or the equivalent member, of supported scaffolds is:
  - At least 36 inches (0.9 m) and not more than 45 inches (1.2 m) above the platform surface for scaffolds manufactured or first placed in service before **January 1, 2000**
  - At least 38 inches (0.97 m) and not more than 45 inches (1.2 m) above the platform surface for scaffolds manufactured or first placed in service after **January 1, 2000**.
- Make sure the height of the top rail top edge, or the equivalent member, of suspended scaffolds that require guardrails and personal fall arrest systems, is at least 36 inches (0.9 m) and not more than 45 inches (1.2 m) above the platform surface. **Exemption:** When conditions warrant, the height of the top edge of the top rail may be greater than 45 inches if the guardrail system meets all other criteria of this chapter
- Make sure the top edge of the top rail doesn't drop below the required height when the minimum load, shown in Table 3, Minimum Top rail and Mid rail Strength Requirements, is used.
- Each top rail and mid-rail, or equivalent member, of a guardrail system must be able to withstand, without failure, the force shown in Table 3, Minimum Top rail and Mid-rail Strength Requirements, when the force is applied as follows:
  - To the top rail in a downward or horizontal direction at any point along its top edge
  - To the mid-rail in a downward or horizontal direction at any point.

**Note:** Mid-rail includes screens, mesh, intermediate vertical members, solid panels, and equivalent structural members of the guardrail system.

Type of Scaffold	Top-rail Capacity	Mid-rail Capacity
Single-point adjustable suspension scaffolds	100 lbs. (445 n)	75 lbs. (333 n)



Type of Scaffold	Top-rail Capacity	Mid-rail Capacity
Two-point adjustable suspension scaffolds		
All other scaffolds Walkways within a scaffold	200 lbs. (890 n)	150 lbs. (666 n)

- - Install mid-rails, screens, mesh, intermediate vertical members, solid panels, or equivalent structural members as follows:
    - Mid-rails at a height approximately midway between the top edge of the guardrail system and the platform surface
    - Screens and mesh:
      - From the top edge of the guardrail system to the scaffold platform; and
      - Along the entire opening between the supports
    - Intermediate members, such as balusters or additional rails, not more than 19 inches (48 cm) apart.
  - Make sure steel or plastic banding isn't used as a top rail or mid-rail.
  - Have a competent person inspect manila rope and plastic or other synthetic rope that's used as a top rail or mid-rail as frequently as necessary to make sure it continues to meet the strength requirements for a top rail or mid-rail.  
**Note:** Crossbraces may be used as a top rail or mid-rail in a guardrail system if they meet the following requirements:
    - The crossing point of the 2 braces is between:
      - 20 inches and 30 inches above the work platform when used as a mid-rail
      - 38 inches and 48 inches above the work platform when used as a top rail
    - The end points at each upright aren't more than 48 inches apart.
  - Make sure guardrails have a surface that prevents:



## ABC Midwest Solutions 2022 Safety Program

- Puncture and laceration injuries; and
- Snagging clothing.
- Make sure any rail extending beyond the post of a guardrail doesn't create a projection hazard.

### **Provide falling object protection.**

- Protect employees from being struck by tools, materials, or equipment falling from a scaffold by doing one or more of the following:
    - Use a barricade to keep employees out of the area where falling objects could be a hazard
    - Install a toe board along the edge of the platform anywhere an object could fall on an employee below
    - Install paneling or screening that covers from the top of the guardrail to the toe board or platform anywhere the toe board is **not** high enough to keep objects from falling off the platform
    - Install a guardrail system with openings small enough to keep potential falling objects from passing through
    - Erect a canopy structure, debris net, or catch platform over employees that does all of the following:
      - Will contain or deflect falling objects
      - Is strong enough to withstand the impact forces
      - Is installed between the falling object hazard and the employees.
      - Make sure potential falling objects that are too large or heavy to be contained or deflected by the falling object protection you're using, are:
        - Moved away from the edge of the surface they could fall from; and
        - Secured, as necessary, to prevent falling
- Reference:** Hardhats and possibly other personal protective equipment has to be used to protect employees exposed to overhead hazards.  
\* Those requirements are found in the Safety and Health



## ABC Midwest Solutions 2022 Safety Program

### Core Rules. Go to the section titled Personal Protective Equipment (PPE)

#### **Provide additional support lines on suspended scaffolds using a canopy for falling object protection.**

- - Equip suspended scaffolds, that use a canopy for falling object protection, with additional independent support lines that meet all of the following:
    - Have the same number of support lines as there are suspension ropes
    - Are equivalent in strength to the suspension ropes
    - Aren't attached to the same point of anchorage as the suspension ropes.

#### **Toe boards must meet these requirements:**

- - Make sure toe boards, when used, are:
    - At least 3-1/2 inches (9 cm) high from the top edge of the toe board to the platform
    - Securely fastened along the outer edge of the platform
    - Installed for enough distance along the platform to protect employees below
    - Installed so the gap between the bottom of the toe board and the platform is 1/4 inch (0.7 cm) or less
    - Solid or with openings that are one inch (2.5 cm) or less in the largest dimension
    - Able to withstand, without failing, a force of at least 50 lbs. (222 n) applied in a downward or horizontal direction anywhere along the toe board.  
**Exemption:** On float (ship) scaffolds, an edging of 3/4 x 1-1/2 inch (2x4 cm) wood or the equivalent may be used instead of a toe board.



### **Train employees who work on a scaffold.**

- Have a qualified person train each employee who works on a scaffold to:
  - Recognize the hazards associated with the type of scaffold they are using; and
  - Understand the procedures to control or minimize the hazards.
- Include the following subjects in your training:
  - Hazards in the work area and how to deal with them, including:
    - Electrical hazards
    - Fall hazards
    - Falling object hazards
    - How to erect, maintain, and disassemble the fall protection and falling object protection systems being used
  - How to:
    - Use the scaffold
    - Handle materials on the scaffold
  - The load-carrying capacity and maximum intended load of the scaffold
  - Any other requirements of this chapter that apply.

### **Train employees who erect, dismantle, operate or maintain scaffolds**

- Have a competent person train each employee who erects, disassembles, moves, operates, repairs, maintains, or inspects scaffolds to recognize any hazards associated with the work.
- Make sure the training includes at least the following subjects:
  - Hazards in the work area and how to deal with them
  - The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold being used



#### ABC Midwest Solutions 2022 Safety Program

- The design criteria, maximum intended load-carrying capacity and intended use of the scaffold
- Any other requirements of this chapter that apply.

#### **Retrain employees when necessary.**

- Retrain employees to reestablish proficiency if you believe they lack the skill or understanding to safely erect, use, or dismantle a scaffold.
- Retraining is required in at least the following situations:
  - An employee's work involving scaffolds is inadequate and indicates they lack the necessary proficiency
  - A change in any of the following that presents a hazard the employee hasn't been trained for:
    - Worksite
    - Type of scaffold
    - Fall protection
    - Falling object protection
    - Other equipment

#### **Suspended scaffolds and scaffold components must meet these strength requirements:**

- Meet the following strength requirements:
  - Suspended scaffolds must support, without failure, the total of their own weight ABC Midwest Solutions, LLCs 4 times the maximum intended load
  - Suspended scaffold components must meet the requirements contained in Table 4, Suspended Scaffold Strength Requirements.
- Surfaces that support scaffold support devices must withstand 4 times the rated load of the hoist:  
**Note:** Scaffold support devices include outrigger beams, cornice hooks, parapet clamps, and similar devices.





These scaffold components	Must meet these strength requirements
<ul style="list-style-type: none"><li>• Adjustable scaffold<ul style="list-style-type: none"><li>○ Suspension ropes, including connecting hardware</li></ul></li></ul>	Support 6 times the rated load of the hoist
<ul style="list-style-type: none"><li>• Adjustable scaffold<ul style="list-style-type: none"><li>○ Direct connections to roofs and floors</li><li>○ Counterweights used to balance the scaffold</li></ul></li></ul>	Resist 4 times the tipping moment with the scaffold operating at the rated load of the hoist
<ul style="list-style-type: none"><li>• Non-adjustable scaffold<ul style="list-style-type: none"><li>○ Suspension ropes, including connecting hardware</li></ul></li></ul>	Support 6 times the maximum intended load applied or transmitted to the rope
<ul style="list-style-type: none"><li>• All other scaffold components</li></ul>	Support its own weight ABC Midwest Solutions, L times the maximum intended load

**Suspended scaffold outrigger beams must meet these requirements:**

- Make sure outrigger beams are made of structural metal or equivalent strength material.
- Stabilize the inboard ends of outrigger beams by using either:
  - Bolts or other direct connections to the floor or roof deck; or
  - Counterweights and tiebacks.  
**Exemption:** Masons' multi-point adjustable scaffold outrigger beams can not be stabilized by counterweights.
- Make sure, before the scaffold is used, that a competent person:



#### ABC Midwest Solutions 2022 Safety Program

- Evaluates the direct connections, and
- Confirms that the supporting surfaces can support the loads placed on them.
- Make sure suspended scaffold outrigger beams are all of the following:
  - Restrained to prevent moving
  - Provided with stop bolts or shackles at both ends
  - Securely fastened together with the flanges turned out when channel iron beams are used in place of I-beams
  - Set and maintained with the web in a vertical position
  - Placed so the suspension rope is centered over the stirrup.
- Place outrigger beams at a right angle (perpendicular) to their bearing support.

**Exemption:** Outrigger beams can be placed at other than a right angle (perpendicular) if:

  - You can demonstrate that immovable obstructions make it impossible to place the beams at a right angle (perpendicular) to their bearing support, and
  - Opposing angle tiebacks are used.

**Note:** The angle between the outrigger beam and the bearing support is usually the same as the angle between the outrigger beam and the face of the building or structure.

#### **Counterweights must be safe and used properly.**

- Make sure counterweights:
  - Are made of material that can't flow; and
  - Have been specifically designed to be used as counterweights.

**Note:** The following can't be used as counterweights:

  - Sand, gravel and similar materials that can be easily dislocated; and
  - Construction material such as masonry units and roofing felt.



## ABC Midwest Solutions 2022 Safety Program

- Secure counterweights to outrigger beams by mechanical means to prevent them from being accidentally detached.
- Leave counterweights attached to the outrigger beams until after the scaffold has been disassembled
- Make sure tiebacks are equivalent in strength to the suspension ropes.
- Make sure tiebacks are secured to a structurally sound anchorage on the building or structure and installed:
  - At a right angle (perpendicular) to the face of the building or structure; or
  - As opposing angle tiebacks.

### **Suspended scaffold support devices must meet these requirements:**

- Make sure suspended scaffold support devices, such as cornice hooks, roof hooks, roof irons, parapet clamps, or similar devices, are:
  - Made of steel, wrought iron, or other material of equivalent strength
  - Supported by bearing blocks
  - Prevented from moving by using tiebacks.

**Reference:** For outrigger beam requirements, go to the Wisconsin State Statue. For tieback requirements, go to the Wisconsin State Statue.

### **Scaffold hoists must meet these requirements:**

- Make sure the stall load of any scaffold hoist is not more than 3 times its rated load.
- Make sure the design of scaffold hoists has been tested by an independent nationally recognized testing laboratory.
- Make sure scaffold hoists have both a:
  - Normal operating brake; and
  - Braking device or locking pawl which automatically engages when the hoist has an uncontrolled:
    - Instantaneous change in momentum; or
    - An accelerated overspeed.



## ABC Midwest Solutions 2022 Safety Program

- Prohibit use of gasoline-powered hoists on suspended scaffolds.
- Enclose the gears and brakes of power-operated hoists used on suspended scaffolds.
- Make sure manually-operated hoists need a positive crank force to descend.

### **Scaffold hoists must retain enough suspension rope.**

- Make sure the suspension rope on winding drum hoists is long enough to wrap around the drum at least 4 times when the scaffold is at its lowest point of travel
- Make sure the suspension rope on hoists that do not use a winding drum:
  - Is long enough to allow the scaffold to be lowered to the level below without the rope end passing through the hoist; or
  - Has the rope end configured, or uses other means, to prevent it from passing through the hoist.

### **Wire rope must be in good condition.**

- Make sure a competent person inspects each rope for defects:
  - Before each work shift; and
  - After anything happens that could affect the rope's integrity.
- Replace a rope if it has any of the following:
  - Physical damage which impairs the function and strength of the rope
  - Kinks that could impair the tracking or wrapping of the rope around a drum or sheave
  - 6 randomly distributed broken wires in one rope lay
  - 3 broken wires in one strand of one rope lay
  - Loss of more than 1/3 of the original diameter of the outside wires caused by abrasion, corrosion, scrubbing, flattening or peening
  - Heat damage caused by a torch
  - Any damage caused by contact with electrical wires



#### ABC Midwest Solutions 2022 Safety Program

- Evidence that the secondary brake has been activated during an overspeed condition and has engaged the suspension rope.
- Prohibit the use of repaired wire rope as suspension rope.

#### **Wire suspension rope connections must meet these requirements:**

- Only use eye splice thimbles connected with shackles or cover plates and bolts to join wire suspension ropes together.
- Make sure the load ends of wire suspension ropes are:
  - Equipped with proper size thimbles
  - Secured by eye splicing or an equivalent means.
- Make sure all swaged attachments or spliced eyes on wire suspension rope has been made by either:
  - The wire rope manufacturer; or
  - A qualified person.

#### **Wire rope clips must be used properly**

- Make sure, if wire rope clips are used on suspended scaffolds, such as on the suspension ropes or support lines, that:
  - A minimum of 3 clips are installed
  - The distance between clips is at least 6 rope diameters
  - Clips are installed according to the manufacturer's recommendations.
- Retighten the clips to the manufacturer's recommendations after the initial loading.
- Inspect the clips and retighten them to the manufacturer's recommendations at the start of each work shift.
- Make sure U-bolt clips aren't used at the point of suspension for any scaffold hoist.
- Make sure, if U-bolt clips are used, that:
  - The U-bolt is placed over the dead end of the rope; and



## ABC Midwest Solutions 2022 Safety Program

- The saddle is placed over the live end of the rope.

### **Prevent swaying of two-point and multi-point suspension scaffolds.**

- Tie or use other means to keep two-point and multi-point suspension scaffolds from swaying, if an evaluation by a competent person determines it is necessary.

**Note:** Window cleaners' anchors cannot be used to secure scaffolds since they aren't designed to withstand the load.

### **Use emergency escape and rescue devices appropriately.**

- Make sure devices whose sole function is to provide emergency escape and rescue aren't used as working platforms.

**Note:** Systems which are designed to function both as suspended scaffolds and emergency systems may be used as working platforms.

### **Protect suspension ropes from heat or corrosive substances**

- Shield suspension ropes from heat-producing processes.
- Make sure, when acids or other corrosive substances are used on a scaffold, that the suspension ropes are protected by at least one of the following:
  - Shielding
  - Treating to protect the rope from the corrosive substances
  - Making the rope of material that the corrosive substance won't damage

### **Take precautions while welding.**

- Do the following to protect employees while welding on suspended scaffolds:
  - Use an insulated thimble to attach each suspension wire rope to its hanging support, such as a cornice hook or outrigger
  - Insulate excess suspension wire rope and any additional independent lines to prevent grounding
  - Cover the wire suspension rope with insulating material that extends at least 4 feet (1.2 m) above the hoist
  - Make sure any tail line that extends below the hoist is:



#### ABC Midwest Solutions 2022 Safety Program

- Insulated to prevent contact with the platform; and
- Guided or retained so it doesn't become grounded.
- Cover each hoist with an insulated protective cover
- Connect the scaffold to the structure using a grounding conductor that:
  - Is at least the size of the welding process work lead; and
  - Isn't in series with the welding process or the work piece.
- Shut off the welding machine if the scaffold grounding lead becomes disconnected
- Make sure an active welding rod or an uninsulated welding lead isn't allowed to contact the:
  - Scaffold; or
  - Scaffold suspension system.

#### **Prohibit use of gasoline-powered equipment on suspended scaffolds.**

- Make sure gasoline-powered equipment is not used on suspended scaffolds.

#### **Meet these requirements when using catenary scaffolds:**

- Make sure catenary scaffolds have:
  - No more than one platform between consecutive vertical pickups; and
  - No more than 2 platforms per scaffold.
- Make sure any platform that's supported by wire ropes has hook-shaped stops placed at each end of the platform that will prevent it from falling if one of the horizontal wire ropes breaks.
- Make sure wire ropes are:
  - Continuous and without splices between anchors; and Not tightened to the point that putting a load on the scaffold will overstress them.  
**Reference:** For specific fall protection requirements for employees on catenary scaffolds, go to Wisconsin State Statues.



**Meet these requirements when using interior hung scaffolds:**

- Suspend the scaffold only from the roof structure or other structural member, such as ceiling beams.
- Inspect the overhead supporting members and check to make sure they're strong enough before erecting the scaffold.
- Connect suspension ropes and cables to the overhead supporting members by:
  - Shackles, clips, or thimbles; or
  - Other means that meet equivalent criteria, such as strength and durability.

**Meet these requirements when using multi-level suspended scaffolds:**

- Equip scaffolds with additional independent support lines that meet all of the following:
  - There are the same number of support lines as there are connection points for the suspension ropes
  - The support lines are equivalent in strength to the suspension ropes
  - The support lines are rigged to support the scaffold if the suspension ropes fail.
- Make sure the independent support lines and the suspension ropes aren't attached to the same points of anchorage.
- Attach platform supports directly to the support stirrup and not to another platform

**Meet these requirements when using multi-point adjustable suspension scaffolds:**

**IMPORTANT:** This requirement applies when using multi-point adjustable suspension scaffolds, stone setters' multi-point adjustable suspension scaffolds, and masons' multi-point adjustable suspension scaffolds.

- Make sure masons' multi-point adjustable suspension scaffold connections are designed by an engineer experienced in designing this type of scaffold.
- Make sure bridges between 2 or more scaffolds meet all of the following:
  - The scaffolds were designed to be bridged





#### ABC Midwest Solutions 2022 Safety Program

- The bridges are articulated
- The hoists are properly sized.
- Make sure passage from one platform to another, without using bridges, is done only when the platforms are:
  - At the same height; and
  - Abutting.
- Suspend scaffolds from:
  - Metal outriggers, brackets, wire rope slings, or hooks; or
  - Other means that meet equivalent criteria, such as strength and durability.

#### **Meet these requirements when using needle beam scaffolds:**

- Install scaffold support beams on edge
- Use ropes or hangers for scaffold supports
  - One end of a needle beam scaffold may be supported by a permanent structural member.
- Securely attach ropes to the needle beams.
- Arrange the support connection to prevent the needle beam from rolling or becoming displaced.
- Securely attach platform units to the needle beams with bolts or equivalent means.  
**Note:** Cleats and overhang aren't adequate means of attachment.  
**Reference:** For specific fall protection requirements for employees on needle beam scaffolds, go to Wisconsin State Statues.

#### **Meet these requirements when using single-point adjustable suspension scaffolds:**

- Make sure 2 scaffolds that have been combined to form a two-point adjustable suspension scaffold meet the requirements of the section, Make sure two-point adjustable suspension scaffolds (swing stages) meet these requirements in the Wisconsin State Statues.
- Make sure scaffolds, where the suspension rope between the scaffold and the suspension device isn't vertical, meet all of the following:



#### ABC Midwest Solutions 2022 Safety Program

- The rigging has been designed by a qualified person
- The scaffold is accessible to rescuers
- The suspension rope is protected from chafing at any point where it changes direction
- The scaffold is positioned so that swinging can't bring the scaffold into contact with another surface.
- Make sure boatswains' chair tackle meets of all of the following:
  - It consists of correct size ball bearing blocks or bushed blocks
  - The blocks contain safety hooks
  - The rope is properly eye-spliced
  - The rope is either:
    - First-grade manila rope that has a diameter of at least 5/8 inch (1.6 cm)
    - or**
    - Other rope that has equivalent characteristics, such as strength and durability.
- Make sure boatswain's chair seat slings meet all of the following:
  - Are reeved through 4 corner holes in the seat
  - Cross each other on the underside of the seat
  - Are rigged to prevent slipping which could cause the seat to become out-of-level
  - Are made from fiber, synthetic, or other rope which have:
    - A diameter of at least 5/8 inch (1.6 cm); and
    - Characteristics equivalent to first grade manila rope, such as strength, slip resistance, and durability.
- Make sure the seat sling of boatswain's chairs used when a heat-producing process, such as gas or arc welding, is being conducted, is at least 3/8 inch (1.0 cm) wire rope.
- Securely fasten cleats to the underside of non cross-laminated wood boatswain's chairs to prevent the board from splitting.



**Reference:** For specific fall protection requirements for employees on single-point adjustable suspension scaffolds, go to Wisconsin State Statues.

**Meet these requirements when using two-point adjustable suspension scaffolds (swing stages):**

**IMPORTANT:** This section doesn't apply to two-point adjustable suspension scaffolds used as masons' or stone setters' scaffolds.

**Reference:** For requirements for masons' or stone setters' scaffolds, go to Wisconsin State Statues

- Make sure platforms more than 36 inches (0.9 m) wide have been designed by a qualified person to prevent unstable conditions.
- Make sure platforms are one of the following:
  - Ladder-type
  - Plank-type
  - Beam-type
  - Light-metal type.
- Make sure the design of light-metal type platforms have been tested and listed by a nationally recognized testing laboratory if they:
  - Have a rated capacity of 750 lbs. or less; or
  - Have a length of 40 feet (12.2 m) or less.
- Securely fasten the platform to the hangers (stirrups) using U-bolts or other means that satisfy the section titled, Make sure suspended scaffolds and scaffold components meet these strength requirements.
- Make sure fiber or synthetic ropes are used with blocks that:
  - Consist of at least one double and one single block; and
  - Have sheaves that fit the size of the rope used.
- Make sure employees move from one platform to another only when all of the following are met:
  - The platforms are at the same height
  - The platforms are abutting



#### ABC Midwest Solutions 2022 Safety Program

- Walk-through stirrups are used that have been specifically designed to allow employee passage.
- Make sure two-point scaffolds that are bridged or otherwise connected together when being raised or lowered meet both of the following:
  - The bridge connections are articulated
  - The hoists are properly sized.

**Reference:** For specific fall protection requirements for employees on two-point adjustable suspension scaffolds, go to Wisconsin State Statutes

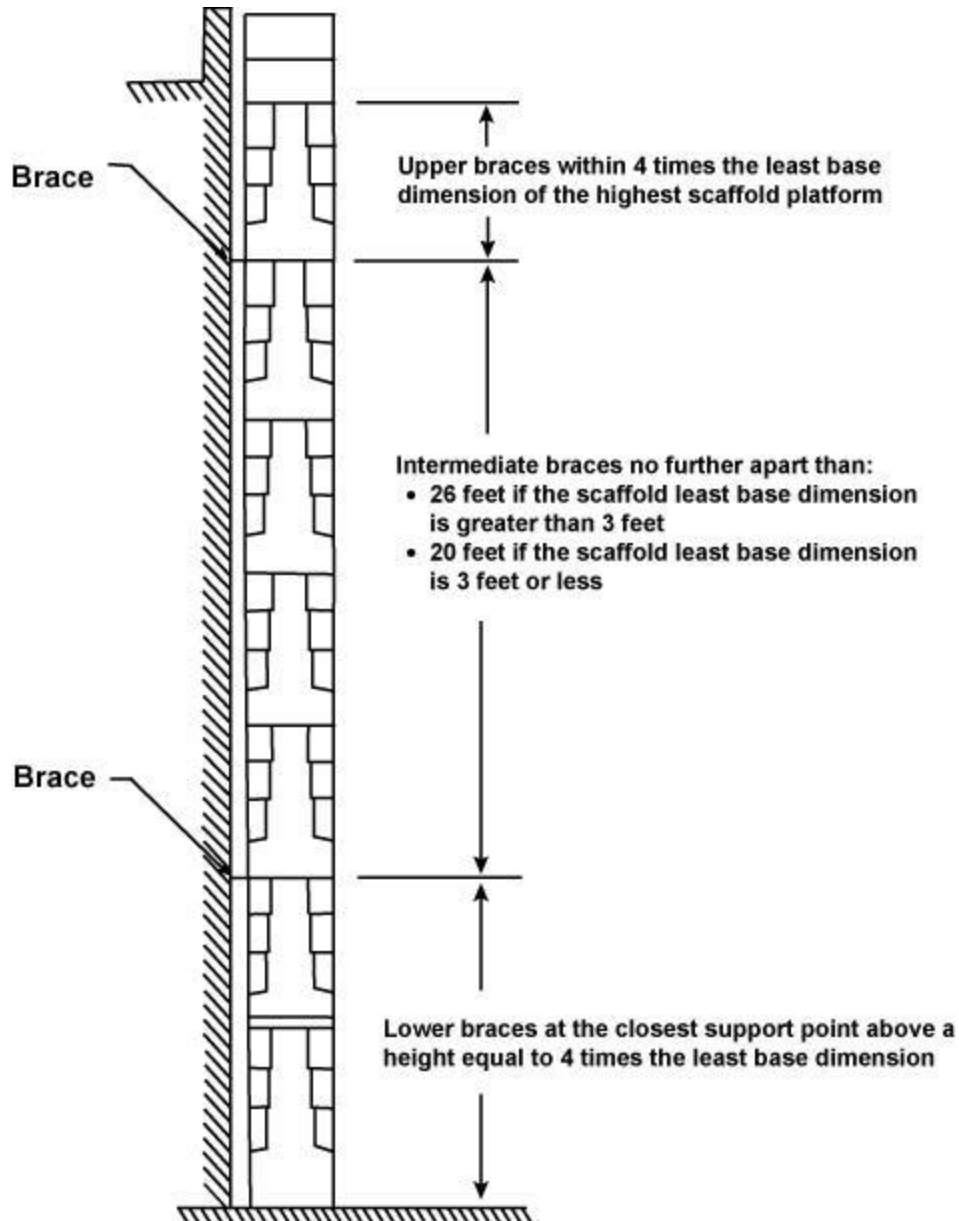
#### **Supported scaffolds and scaffold components must meet strength requirements:**

- Make sure each supported scaffold and scaffold component can support, without failure, the total of its own weight ABC Midwest Solutions, LLCs at least 4 times the maximum intended load applied or transmitted to it.

#### **Prevent supported scaffolds from tipping**

- Make sure supported scaffolds with a height to least base dimension ratio of greater than 4 to one are prevented from tipping by one or more of the following:
  - Guying
  - Tying
  - Bracing
  - Other equivalent means.

**Note:** The least base dimension includes outriggers, if used.



- Install guys, ties, and braces where horizontal members support both the inner and outer legs of the scaffold.
- Install guys, ties, and braces:
  - According to the scaffold manufacturer's recommendations; or
  - At all points where the following horizontal and vertical planes meet:
    - First vertical level at a height equal to 4 times the least base dimension
    - Subsequent vertical levels every:



#### ABC Midwest Solutions 2022 Safety Program

- 20 feet (6.1 m) or less for scaffolds having a width of 3 feet (0.91 m) or less
- 26 feet (7.9 m) or less for scaffolds more than 3 feet (0.91 m) wide
- Horizontally at:
  - Each end of the scaffold; and
  - Intervals of 30 feet (9.1 m) or less.

**Note:** The 30-foot horizontal intervals are measured from one end of the scaffold to the other.

- Make sure the highest level of guys, ties, or braces is no further from the top of the scaffold than a distance equal to 4 times the least base dimension.
- Make sure scaffolds that have an eccentric load applied or transmitted to them, such as a cantilevered work platform, are prevented from tipping by one or more of the following:
  - Guying
  - Tying
  - Bracing
  - Outriggers
  - Other equivalent means.

#### **Supported scaffolds must be properly supported.**

- Make sure supported scaffold poles, legs, posts, frames, and uprights are:
  - ABC Midwest Solutions, LLC and
  - Braced to prevent swaying or displacement.
- Make sure supported scaffold poles, legs, posts, frames, and uprights, bear on base plates that rest on:
  - Mudsills; or
  - Other firm foundations such as concrete or dry, compacted soil.
- Make sure foundations are all of the following:



## ABC Midwest Solutions 2022 Safety Program

- Level
- Sound
- Rigid
- Capable of supporting the loaded scaffold without settling or displacement.

**Note:** The condition of the foundation may change due to weather or other factors. If changes occur, the foundation needs to be evaluated by a competent person to make sure it will safely support the scaffold.

- Make sure unstable objects aren't used:
  - To support scaffolds or platform units; or
  - As working platforms.
- Make sure mobile scaffolds meet these additional requirements:
  - Wheel and caster stems are pinned or otherwise secured in the scaffold legs or adjustment screws
  - Wheels and casters are locked, or equivalent means are used, to prevent movement when the scaffold is being used
  - Screw jacks or other equivalent means are used if it's necessary to level the work platform.
- Make sure front-end loaders and similar equipment used to support scaffold platforms have been specifically designed for such use by the manufacturer.  
**Reference:** When forklifts or other powered industrial trucks are used for personal lifting on support scaffold platforms, follow the requirements found in Forklifts and Other Powered Industrial Trucks, per Wisconsin State Statutes

### **Provide safe access for persons erecting or dismantling supported scaffolds.**

- Provide a safe means of access for persons erecting or dismantling scaffolds if it is:
  - Feasible; and
  - Does not create a greater hazard.
- Have a competent person determine the feasibility of providing safe access.



#### ABC Midwest Solutions 2022 Safety Program

- Make sure the determination is based on site conditions and the type of scaffold being erected or dismantled.
- Install a hook-on or attachable ladder as soon as scaffold erection has progressed to a point where it can be safely installed and used.
- Make sure cross braces on tubular welded frame scaffolds aren't used to access or egress from the scaffold.
- Make sure the frames of tubular welded frame scaffolds that are used as climbing devices meet all of the following:
  - Create a usable ladder
  - Provide good hand holds and foot space
  - Have horizontal members that are all of the following:
    - Parallel
    - Level
    - Spaced not more than 22 inches apart vertically

#### **Provide fall protection for persons erecting or dismantling supported scaffolds.**

- Have a competent person determine the feasibility of providing fall protection for persons erecting or dismantling supported scaffolds.
- Provide fall protection if the installation and use of fall protection is:
  - Feasible; and
  - Does not create a greater hazard.

#### **Meet these requirements when moving mobile scaffolds:**

- Make sure, before a scaffold is moved, that employees on the scaffold are made aware of the move.
- Apply manual force being used to move a scaffold:
  - As close to the base as practicable; and
  - Within 5 feet (1.5 m) of the supporting surface.
- Make sure power systems used to propel mobile scaffolds have been designed for such use.





### ABC Midwest Solutions 2022 Safety Program

- Make sure forklifts, trucks, similar motor vehicles, or add-on motors aren't used to propel scaffolds unless the scaffold has been designed to be used with that type of propulsion system.
- Stabilize scaffolds to prevent tipping when they're being moved.
- Make sure a scaffold isn't moved with employees riding on it unless all of the following are met:
  - The surface on which the scaffold is being moved is:
    - Within 3 degrees of level; and
    - Free of pits, holes, and obstructions
  - No employee is on any part of the scaffold which extends out beyond the wheels, casters, or other supports
  - Outrigger frames, when used, are installed on both sides of the scaffold
  - The power system, if used:
    - Applies the propelling force directly to the wheels; and
    - Produces a speed of one foot per second (.3 mps) or less
  - The height of the scaffold:
    - Isn't more than 2 times the least base dimension; or
    - The scaffold is designed and constructed to meet or exceed nationally recognized stability test requirements, such as those listed in ANSI/SIA A92.5, Boom-Supported Elevating Work Platforms, and ANSI/SIA A92.6, Self-Propelled Elevating Work Platforms.

#### **Meet these requirements when using bricklayers' square scaffolds (squares):**

- Reinforce wood scaffolds with gussets on both sides of each corner.
- Make sure diagonal braces are installed:
  - On all sides of each square
  - Between squares on the front and back sides of the scaffold



#### ABC Midwest Solutions 2022 Safety Program

- Extending from the bottom of each square to the top of the next square.
- Make sure scaffolds meet all of the following:
  - Are no more than 3 tiers high
  - Are constructed and arranged so that each square rests directly above another square
  - The upper tiers:
    - Stand on a continuous row of planks laid across the next lower tier; and
    - Are nailed down or otherwise secured to prevent displacement.

#### **Meet these requirements when using fabricated frame scaffolds (tubular welded frame scaffolds):**

- Make sure scaffolds over 125 feet (38.0 m) high above their base plates are:
  - Designed by a registered professional engineer; and
  - Constructed and loaded as specified in the design.
- Brace frames and panels using cross braces, horizontal braces, diagonal braces, or a combination thereof to secure vertical members together laterally.
- Make sure the length of the cross braces will:
  - Automatically square and align the vertical members; and
  - Make the scaffold plumb, level, and square.
- Secure all brace connections.
- Join frames and panels together vertically by using one of the following:
  - Coupling pins
  - Stacking pins
  - Equivalent means.



## ABC Midwest Solutions 2022 Safety Program

- Use pins or other equivalent means to lock scaffold frames or panels together vertically where uplift may occur.
- Make sure brackets used to support cantilevered loads are all of the following:
  - Seated with side-brackets parallel to the frames and end-brackets at 90 degrees to the frames
  - Not bent or twisted from these positions
  - Used only to support persons.

**Exemption:** Brackets may be used to support cantilevered loads other than personnel if the scaffold has been:

- Designed for other loads by a qualified engineer; and
- Built to withstand the tipping forces caused by those loads.
- Leave existing platforms undisturbed until new end frames have been set in place and braced, then move the platforms to the next level.

### **Meet these requirements when using integral prefabricated scaffold access frames:**

- Make sure integral prefabricated scaffold access frames meet all of the following:
  - Have been specifically designed and constructed to be used as ladder rungs
  - Have a rung length of at least 8 inches (20 cm)
  - Have a maximum spacing between rungs of 16-3/4 inches (43 cm)
  - Are uniformly spaced within each frame section
  - Have rest platforms at least every 20 feet (6.1 m) on all supported scaffolds more than 24 feet (7.3 m) high.

**Note:** Non uniform rung spacing caused by joining end frames together is allowed, provided the resulting spacing doesn't exceed 16-3/4 inches (43 cm).

- Make sure, when panels with rungs that are less than 11-1/2 inches long are used as work platforms, that employees use either:



#### ABC Midwest Solutions 2022 Safety Program

- A positioning device; or
- A personal fall arrest system.
- **Reference:**
  - For personal fall arrest system requirements in this chapter, go to the Wisconsin State Statutes.
  - For construction activities, go to Fall Restraint and Fall Arrest.

#### **Meet these requirements when using form scaffolds and carpenter's bracket scaffolds:**

- Secure folding-type metal brackets that have been extended for use, with:
  - Bolts; or
  - Locking-type pins.
- Make sure wooden bracket-form scaffolds are an integral part of the form panel.
- Attach each bracket, other than those for wooden bracket-form scaffolds, to the supporting formwork or structure by using one or more of the following:
  - Nails
  - A metal stud attachment device
  - Welding
  - Hooking over a secured structural supporting member, with the form waleing either:
    - Bolted to the form; or
    - Secured by snap ties or tie bolts extending through the form and securely anchored
  - For carpenters' bracket scaffolds only, using a bolt extending through to the opposite side of the structure's wall.

#### **Meet these requirements when using horse scaffolds:**

- Make sure horse scaffolds aren't constructed or arranged higher than 2 tiers or 10 ft. (3.0 m), whichever is less.
- Do all of the following if horses are arranged in tiers:



#### ABC Midwest Solutions 2022 Safety Program

- Place each horse directly over the horse in the tier below
- Nail down or otherwise secure the legs of each horse to prevent displacement
- Cross brace each tier.

#### Meet these requirements when using ladder jack scaffolds:

- Make sure platform height isn't higher than 20 feet (6.1 m).
- Make sure ladder jacks are designed and constructed so they rest:
  - On the side rails and ladder rungs together; or
  - Only on the rungs.
- Make sure ladder jacks that rest on rungs only have a bearing area that includes a length of at least 10 inches (25.4 cm) on each rung.
- Make sure ladders used to support ladder jacks are:
  - Type I (250 lbs. rated capacity) or Type IA (300 lbs. rated capacity); and
  - Are placed, fastened, or equipped with devices to prevent slipping

**Note:** Ladders with a duty rating or weight capacity greater than a Type I ladder (250 lbs.) satisfy the requirement to use Type I or IA ladder.

- Make sure job-made ladders aren't used to support ladder jack scaffolds.
- Make sure scaffold platforms aren't bridged together.  
**Reference:** There are specific fall protection requirements for employees using ladder jack scaffolds. Go to Wisconsin State Statutes.
  - Requirements for portable and fixed ladders are found in chapter Wisconsin State Statutes in Ladders, portable and fixed.

#### Meet these requirements when using outrigger scaffolds:

- Make sure outrigger scaffolds and scaffold components are:
  - Designed by a registered professional engineer; and
  - Constructed and loaded as specified in the design.



### ABC Midwest Solutions 2022 Safety Program

- Make sure the part of the outrigger beam from the fulcrum point to the **inboard** end (farthest point of anchorage) is at least 1-1/2 times longer than the part from fulcrum point to the **outboard** end (the platform side).
- Place I-beam or channel shaped outrigger beams so that the web section is vertical.
- Make sure the fulcrum point of outrigger beams rests on secure bearings at least 6 inches (15.2 cm) in each horizontal dimension.
- Make sure outrigger beams are:
  - Secured in place to prevent movement; and
  - Securely braced at the fulcrum point against tipping.
- Securely anchor the inboard ends of outrigger beams by using one or both of the following:
  - Braced struts bearing against sills that are in contact with the overhead beams or ceiling; or
  - Tension members secured to the floor joists below.
- Securely brace the entire supporting structure to prevent any horizontal movement.
- Nail, bolt, or otherwise secure platform units to the outriggers to prevent platform displacement. Platform units must extend to within 3 inches of the building wall.

### **Meet these requirements when using pole scaffolds:**

- Make sure pole scaffolds over 60 feet high are:
  - Designed by a registered professional engineer; and
  - Constructed and loaded as specified in the design.
- Leave existing platforms undisturbed until new bearers have been set in place and braced before moving the platforms to the new level.
- Install bracing on double-pole scaffolds as follows:
  - Cross bracing between the inner and outer sets of poles
  - Diagonal bracing in both directions across the entire outside face of the scaffold



#### ABC Midwest Solutions 2022 Safety Program

- Diagonal bracing in both directions across the entire inside face of scaffolds that are used to support loads equivalent to a uniformly distributed load of 50 lbs. (222 kg) or more per square foot (929 sq. cm).
- Install diagonal bracing on single pole scaffolds in both directions across the entire outside face of the scaffold.
- Make sure runners meet all of the following:
  - Are installed on edge
  - Extend over a minimum of 2 poles
  - Are supported by bearing blocks securely attached to the poles.
- Make sure bearers are:
  - Installed on edge; and
  - Extend a minimum of 3 inches (7.6 cm) over the outside edges of runners.
- Make sure runners, bearers, and braces aren't spliced between poles.
- Make sure wood poles that are spliced together meet both of the following
  - The ends of the poles at the splice:
    - Are square; and
    - The upper section rests squarely on the lower section
  - Wood splice plates are provided that meet all of the following:
    - Are installed on at least 2 adjacent sides
    - Extend at least 2 feet (0.6 m) on either side of the splice
    - Overlap the abutted ends equally
    - Have the same cross-sectional areas as the pole.

**Note:** Splice plates of material other than wood may be used if they are of equivalent strength.

**Meet these requirements when using pump jack scaffolds:**



## ABC Midwest Solutions 2022 Safety Program

- Make sure pump jack brackets, braces, and accessories are made from metal plates and angles.
- Make sure pump jack brackets have 2 positive gripping mechanisms to prevent any failure or slippage.
- Secure poles to the structure using rigid triangular bracing or the equivalent located at all of the following:
  - Top
  - Bottom
  - Other points on the pole as necessary.
- Do both of the following when the pump jack has to pass bracing that's already installed:
  - Install an additional brace approximately 4 feet (1.2 m) above the brace to be passed
  - Leave it in place until:
    - The pump jack has been moved; and
    - The original brace is reinstalled
- Make sure work benches aren't used as scaffold platforms.  
**Note:** A work bench may be used as a top rail only if it meets the top rail requirements in, Make sure guardrail systems meet these requirements, Wisconsin State Statues.
- Make sure wood poles used with pump jack scaffolds are:
  - Straight grained; and
  - Free of shakes, large loose or dead knots, and other defects which might impair strength.
- Make sure wood poles that are constructed of 2 continuous lengths are joined together with the seam parallel to the bracket.
- Install a mending plate at all splices to develop the full strength of the member when splicing two-by-fours together to make a pole.

### **Meet these requirements when using repair bracket scaffolds:**

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## ABC Midwest Solutions 2022 Safety Program

- Make sure brackets are all of the following:
  - Secured in place by at least one wire rope that's at least 1/2 inch (1.27 cm) in diameter
  - Attached to the securing wire rope by a positive locking device, or equivalent, that will prevent the bracket from being unintentionally detached from the rope
  - Provided with a shoe, heel block, foot, or a combination that:
    - Is located at the contact point between the supporting structure and the bottom of the bracket; and
    - Will prevent lateral movement of the bracket
- Secure the platforms to the brackets in a way that prevents:
  - The platforms from separating from the brackets; and
  - The platforms or brackets from moving on a completed scaffold.
- Make sure wire rope placed around the structure to provide a safe anchorage for personal fall arrest systems used by employees erecting or dismantling scaffolds:
  - Is at least 5/16 inch (0.8 cm) in diameter; and
  - Provides an anchorage that meets the requirements of Wisconsin State Statutes.
    - For construction activities, go to Fall Restraint and Fall Arrest in the Safety Standards for Construction Work, Wisconsin State Statute - Scaffolds.
  - Make sure each wire rope used for securing brackets in place or as an anchorage for personal fall arrest systems is all of the following:
    - Protected from damage due to contact with edges, corners, protrusions, or other parts of the supporting structure or scaffold components
    - Tensioned by a turnbuckle or equivalent means. Turnbuckles must be:
      - At least one inch (2.54 cm) in diameter; and



#### ABC Midwest Solutions 2022 Safety Program

- Connected to the other end of its rope by an eye splice thimble that's sized appropriate to the turnbuckle
- Not used with U-bolt wire rope clips.
- Make sure materials aren't dropped to the outside of the supporting structure.
- Erect the scaffold by progressing around the structure in only one direction

#### **Meet these requirements when using roof bracket scaffolds:**

- Make sure scaffold brackets meet all of the following:
  - Are constructed to fit the pitch of the roof
  - Provide a level support for the platform
  - Are anchored in place by nails.

**Note:** If it's not practical to use nails to anchor brackets, secure them in place with first grade manila rope of at least 3/4 inch (1.9 cm) diameter, or equivalent.

#### **Meet these requirements when using step, platform and trestle ladder scaffolds:**

- Make sure ladders used to support step, platform, and trestle ladder scaffolds are:
  - Type I (250 lb. rated capacity) or Type IA (300 lb. rated capacity); and
  - Placed, fastened, or equipped with devices to prevent slipping.

**Note:** Ladders with a duty rating or weight capacity greater than a Type I ladder (250 lbs.) satisfy the requirements to use a Type I or Type IA ladder.

- Make sure job-made ladders aren't used to support step, platform, and trestle ladder scaffolds.

#### **Reference:**

- There are specific fall protection requirements for employees using ladder jack scaffolds. Go to Wisconsin State Statutes
- Requirements for portable and fixed ladders are found in Wisconsin State Statutes under Ladders, portable and fixed.



### ABC Midwest Solutions 2022 Safety Program

- Make sure scaffold platforms aren't placed higher than the second highest rung or step of the ladder supporting the platform.
- Make sure scaffold platforms aren't bridged together.

### **Meet these requirements when using tube and coupler scaffolds:**

- - Make sure tube and coupler scaffolds over 125 feet high are:
    - Designed by a registered professional engineer; and
    - Constructed and loaded as specified in the design.
  - Leave existing platforms undisturbed until new bearers have been set in place and braced before moving the platforms to the new level.
  - Install cross bracing across the width of the scaffold that meets all of the following:
    - Bracing is installed at:
      - Each end of the scaffold; and
      - At least at every third set of posts horizontally and every fourth runner vertically.
    - Bracing extends diagonally from the:
      - Outer posts or runners upwards to the next inner posts or runners  
and
      - Inner posts or runners upwards to the next outer posts or runners.
  - Install building ties:
    - At the bearer levels between the cross bracing; and
    - At locations specified in the Wisconsin State Statues.
  - Install longitudinal bracing on straight run scaffolds as follows:
    - Diagonally in both directions across the inner and outer rows of posts



### ABC Midwest Solutions 2022 Safety Program

- From the base of the end posts upward to the top of the scaffold at approximately a 45 degree angle
- As close as possible to the intersection of the bearer and post or runner and post
- If the scaffold is longer than it is tall, repeat the bracing beginning at every fifth post
- If the scaffold is taller than its length, install the bracing:
  - From the base of the end posts upward to the opposite end posts;  
and
  - In alternating directions until reaching the top of the scaffold.
- Attach bracing to the runners as close to the post as possible, if bracing can't be attached to the post.
- Make sure bearers meet all of the following:
  - Are installed transversely between posts
  - If the bearer is coupled to the post, have the inboard coupler bear directly on the runner coupler
  - If the bearer is coupled to the runners, have the couplers as close to the posts as possible
  - Extend bearers beyond the posts and runners
  - Provide full contact with the coupler
  - The bottom bearers are located as close to the base as possible.
- Make sure runners meet all of the following:
  - Are installed along the length of the scaffold
  - Are located on both the inside and outside posts at the same height
  - Are interlocked on straight runs to form continuous lengths and are coupled to each post
  - The bottom runners are located as close to the base as possible.



## ABC Midwest Solutions 2022 Safety Program

**Note:** Tube and coupler guardrails and mid rails installed on outside posts can be used in lieu of outside runners.

- Make sure couplers are made of a structural metal, such as drop-forged steel, malleable iron, or structural grade aluminum.
- Prohibit using couplers made of gray cast iron.

### **Meet these requirements when using window jack scaffolds:**

- - Make sure window jack scaffolds meet all of the following:
    - Are securely attached to the window opening
    - Are used for working only at the window opening the jack is placed through
    - Aren't used:
      - To support planks placed between one window jack and another; or
      - As any other element of scaffolding

Adjustable suspension scaffold: A suspended scaffold equipped with one or more hoists that can be operated by employees on the scaffold

Bearer: A horizontal scaffold member (which may be supported by ledgers or runners) upon which the scaffold platform rests and which joins scaffold uprights, posts, poles, and similar members.

Boatswains' chair: A single-point adjustable suspended scaffold consisting of a seat or sling designed to support one employee in a sitting position.

Brace: A rigid connection that holds one scaffold member in a fixed position with respect to another member, or to a building or structure.

Bricklayers' square scaffold: A supported scaffold composed of framed squares which support a platform

Carpenters' bracket scaffold: A supported scaffold consisting of a platform supported by brackets attached to building or structural walls.



## ABC Midwest Solutions 2022 Safety Program

Catenary scaffold: A suspended scaffold consisting of a platform supported by 2 essentially horizontal and parallel ropes attached to structural members of a building or other structure. Additional support may be provided by vertical pickups

Cleat: A structural block used at the end of a platform to prevent the platform from slipping off its supports. Cleats are also used to provide footing on sloped surfaces such as access ramps.

Competent person: Someone who – Is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees and has the authority to take prompt corrective measures to eliminate them.

Coupler: A device for locking together the tubes of a tube and coupler scaffold.

Double-pole (independent pole) scaffold: A supported scaffold consisting of one or more platforms resting on cross beams (bearers) supported by ledgers and a double row of uprights independent of support (except ties, guys, braces) from any structure.

Equivalent: Alternative design, material or method to protect against a hazard. You have to demonstrate it provides an equal or greater degree of safety for employees than the method, material or design specified in the rule.

Exposed power lines: Electrical power lines which are accessible to and may be contacted by employees. Such lines don't include extension cords or power tool cords.

Eye or eye splice: A loop at the end of a wire rope.

Fabricated frame scaffold (tubular welded frame scaffold): A scaffold consisting of platforms supported on fabricated frames with integral posts, horizontal bearers, and intermediate members.

Failure: Load refusal, breaking, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

Float (ship) scaffold: A suspended scaffold consisting of a braced platform resting on 2 parallel bearers and hung from overhead supports by ropes of fixed length.

Form scaffold: A supported scaffold consisting of a platform supported by brackets attached to formwork.

Guard rail system: A vertical barrier, consisting of, but not limited to, top rails, mid rails, and posts, erected to prevent employees from falling off a scaffold platform or walkway.

Hand rails (ladder stands): A rail connected to a ladder stand running parallel to the slope and/or top step.

Hoist: A manual or power-operated mechanical device to raise or lower a suspended scaffold.

Horse scaffold: A supported scaffold consisting of a platform supported by construction horses (saw horses). Horse scaffolds constructed of metal are sometimes known as trestle scaffolds.

Independent pole scaffold: See double pole scaffold.

Interior hung scaffold: A suspended scaffold consisting of a platform suspended from



## ABC Midwest Solutions 2022 Safety Program

the ceiling or roof structure by fixed length supports.

Ladder jack scaffold: A supported scaffold consisting of a platform resting on brackets attached to ladders.

Ladder stand: A mobile, fixed-size, self-supporting ladder consisting of a wide flat tread ladder in the form of stairs.

Landing: A platform at the end of a flight of stairs.

Large area scaffold: A pole scaffold, tube and coupler scaffold, system scaffold, or fabricated frame scaffold erected over substantially the entire work area. For example: A scaffold erected over the entire floor area of a room.

Lean-to scaffold: A supported scaffold which is kept erect by tilting it toward and resting it against a building or structure.

Ledger: See runner.

Lifeline: A component consisting of a flexible line that connects to an anchorage at one end to hang vertically (vertical lifeline), or that connects to anchorages at both ends to stretch horizontally (horizontal lifeline). It serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Lower levels: Areas below the level where the employee is located and to which an employee can fall. Such areas include, but aren't limited to, ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, materials, water, and equipment.

Masons' adjustable supported scaffold: See self-contained adjustable scaffold.

Masons' multi-point adjustable suspension scaffold: A continuous run suspended scaffold designed and used for masonry operations.

Maximum intended load: The total load of all persons, equipment, tools, materials, transmitted loads, and other loads reasonably anticipated to be applied to a scaffold or scaffold component at any one time.

Mid rail: A rail, approximately midway between the top rail of a guardrail system and the platform, and secured to the uprights erected along the exposed sides and ends of a platform.

Mobile scaffold: Supported scaffold mounted on casters or wheels.

Multi-level suspended scaffold: A two-point or multi-point adjustable suspension scaffold with a series of platforms at various levels resting on common stirrups.

Multi-point adjustable suspension scaffold: A suspended scaffold consisting of a platform(s) which is suspended by more than 2 ropes from overhead supports and equipped with means to raise and lower the platform to desired work levels.

Needle beam scaffold: A suspended scaffold which has a platform supported by 2 bearers(needle beams) suspended from overhead supports.

Outrigger: A structural member of a supported scaffold which increases the base width of a scaffold. This provides support for and increases the stability of the scaffold.

Outrigger beam (suspended and supported): The structural member of a suspended scaffold or outrigger scaffold which provides support for the scaffold by extending the scaffold point of attachment to a point out and away from the structure or building.

Outrigger scaffold: A supported scaffold consisting of a platform resting on outrigger beams which projects beyond the wall or face of the building or structure. The inboard ends of the outrigger beams are secured inside the building or structure.



## ABC Midwest Solutions 2022 Safety Program

Overhand bricklaying: The process of laying bricks and masonry so that the surface of the wall is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. It includes mason tending and electrical installation incorporated into the brick wall during the overhand bricklaying process.

Personal fall arrest system: A system used to arrest an employee's fall. It consists of an anchorage, connectors, and body harness and may also include a lanyard, deceleration device, lifeline, or combinations of these.

Platform: A work surface used in scaffolds, elevated above lower levels. Platforms can be constructed using individual wood planks, fabricated planks, fabricated decks, and fabricated platforms.

Pole scaffold: See single-pole scaffold and double (independent) pole scaffold.

Pump jack scaffold: A supported scaffold consisting of a platform supported by vertical poles and movable support brackets.

Qualified Person: A person who has successfully demonstrated the ability to solve problems relating to the subject matter, work, or project, either by:

- Possession of a recognized degree, certificate, or professional standing or
- Extensive knowledge, training and experience.

Rated load: The manufacturer's specified maximum load to be lifted by a hoist or to be applied to a scaffold or scaffold component.

Repair bracket scaffold: A supported scaffold consisting of a platform supported by brackets. The brackets are secured in place around the circumference or perimeter of a chimney, stack, tank or other supporting structure by one or more wire ropes placed around the supporting structure.

Roof bracket scaffold: A supported scaffold used on a sloped roof. It consists of a platform resting on angular-shaped supports so that the scaffold platform is level.

Runner (ledger): The lengthwise horizontal spacing or bracing member which may support the bearers.

Scaffold: A temporary elevated platform, including its supporting structure and anchorage points, used for supporting employees or materials.

Self-contained adjustable scaffold: A combination supported and suspended scaffold consisting of an adjustable platform mounted on an independent supporting frame, not a part of the object being worked on, which is equipped with a means to raise and lower the platform. Such systems include rolling roof rigs, rolling outrigger systems, and some masons' adjustable supported scaffolds.

Shore scaffold: A supported scaffold which is placed against a building or structure and held in place with props.

Single-point adjustable suspension scaffold: A suspended scaffold consisting of a platform suspended by one rope from an overhead support and equipped with means to permit the movement of the platform to desired work levels.

Single-pole scaffold: A supported scaffold consisting of platforms resting on bearers, the outside ends of which are supported on runners secured to a single row of posts or uprights, and the inner ends of which are supported on or in a structure or building wall.





## ABC Midwest Solutions 2022 Safety Program

Stair tower (scaffold stairway/tower): A tower comprised of scaffold components which contain internal stairway units and rest platforms. These towers are used to provide access to scaffold platforms and other elevated points such as floors and roofs.

Stall load: The load at which the prime mover of a power-operated hoist stalls or the power to the prime mover is automatically disconnected.

Step, platform, and trestle ladder scaffold: A platform resting directly on the rungs of a step, platform, or trestle ladder.

Stilts: A pair of poles or similar supports with raised footrests, used to permit walking above the ground or working surface.

Stone setters' multi-point adjustable suspension scaffold: A continuous run suspended scaffold designed and used for stone setters' operations.

Supported scaffold: One or more platforms supported by rigid means such as outrigger beams, brackets, poles, legs, uprights, posts, or frames.

Suspended scaffold: One or more platforms suspended from an overhead structure by ropes or other non-rigid means.

System scaffold: A scaffold consisting of posts with fixed connection points that accept runners, bearers, and diagonals that can be interconnected at predetermined levels.

Toe board (scaffold): A barrier erected along the exposed sides and ends of a scaffold platform at platform level to prevent material, tools, and other loose objects from falling from the platform.

Top plate bracket scaffold: A scaffold supported by brackets that hook over or are attached to the top of a wall. This type of scaffold is similar to carpenters' bracket scaffolds and form scaffolds.

Tube and coupler scaffold: A scaffold consisting of platforms supported by tubing, erected with coupling devices connecting uprights, braces, bearers, and runners.

Tubular welded frame scaffold: See fabricated frame scaffold. Tubular welded sectional folding scaffold: A sectional, folding metal scaffold either of ladder frame or inside stairway design. It's substantially built of prefabricated welded sections, which consist of end frames, platform frame, inside inclined stairway frame and braces, or hinged connected diagonal and horizontal braces. It can be folded into a flat package when the scaffold isn't in use.

Two-point suspension scaffold (swing stage): A suspended scaffold consisting of a platform supported by hangers (stirrups), suspended by 2 ropes from overhead supports, and equipped with means to permit the raising and lowering of the platform to desired work levels.

Unstable objects: Items whose strength, configuration, or lack of stability may allow them to become dislocated and shift and therefore may not properly support the loads imposed on them. Unstable objects don't constitute a safe base support for scaffolds, platforms, or employees. Examples include, but aren't limited to, barrels, boxes, loose brick, and concrete blocks.

Vertical pickup: A rope used to support the horizontal rope in a catenary scaffold.

Walkway (scaffold): Part of a scaffold used only for access and not as a working level.



ABC Midwest Solutions 2022 Safety Program

Window jack scaffold: A platform resting on a bracket or jack that projects through a window opening.

Work level: The elevated platform, used for supporting workers and their materials.



## 15. Thermal Stress

### 1.0 Introduction

Some employees at ABC MIDWEST SOLUTIONS, LLC, primarily those who work outdoors, may be exposed to temperatures that cause heat or cold stress. Employees who work outside of the “comfort zone” may experience decreased levels of productivity and quality of work.

The frequency of accidents also increases. Increased body temperature and physical discomfort promote irritability, anger, and other emotional states, which sometimes cause workers to overlook safety procedures or to divert attention from hazardous tasks. Working in a hot environment lowers the mental alertness and physical performance of an individual.

In addition, heat tends to promote accidents due to the slipperiness of sweaty palms and dizziness. The possibility of burns from accidental contact also exists wherever there are hot surfaces. In addition, employees may experience illness or injury as a direct result of temperature exposure. Atmospheric temperatures just above 89°F can also be dangerous, especially when humidity is high. On average, approximately 384 people a year die from heat-related illnesses.<sup>1</sup> Cold injuries can occur in atmospheric temperatures as high as 60°F when the body is wet. Manual dexterity drops when there is uninterrupted work for 10-20 minutes at temperatures below 61°F.

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<sup>1</sup> “We’re Having a Heat Wave...,” *Membership Advantage* Vol.2, Issue 2 (National Safety Council, April 1999)

### 2.0 Regulation

Under Wisconsin occupational health standards, workers who are exposed to temperature extremes, radiant heat, humidity, or air velocity combinations that are likely to cause a harmful physiological response must be protected.

### 3.0 Factors Associated With Thermal Stress

- 3.1 Cold Stress

Presence of wet clothing, contact with metals, wind-chill, and difference in temperature between the body and its surroundings directly influence the risk and extent of cold injuries. Vulnerability is increased when cardiovascular disease, diabetes, alcohol or caffeine intake, exhaustion, old age, and/or hunger impair



circulation. Constrictive clothing, such as boots tied too tight, or a cramped position may also affect the occurrence of cold stress.

### 3.2 Heat Stress

Climatic conditions, such as temperature, humidity, and wind speed affect the amount of stress a worker faces in a hot work environment. Work demands and clothing characteristics, such as insulating ability, permeability, and ventilation are also important factors.

As with cold stress, people with health problems, such as high blood pressure or some heart conditions may be more sensitive to heat exposure. People who take diuretics (water pills) are also at risk.

## 4.0 Health Effects

Should an employee experience any of the symptoms listed below, the employee should contact their doctor or call the main office.

### Symptoms of Cold Stress

The following table is reproduced from the National Safety Council’s Fundamentals of Industrial Hygiene, 4th edition.

### Cold-Related Disorders Including the Symptoms, Signs, Causes, and Steps for First Aid

Disorder	Symptoms	Signs	Causes	F
Hypothermia	Chills Pain in extremities Fatigue or drowsiness	Euphoria Slow, weak pulse Slurred speech Collapse Shivering Unconsciousness Body temperature <95 F (35 C)	Excessive exposure Exhaustion or dehydration Subnormal tolerance (genetic or acquired)	M ar cl M w h et D fl T
Frostbite	Burning sensation at first Coldness, numbness, tingling	Skin color white or grayish yellow to reddish violet to black Blisters Response to touch	Exposure to cold Vascular disease	M ar cl E (e D



ABC Midwest Solutions 2022 Safety Program

Disorder	Symptoms	Signs	Causes	
		depends on depth of freezing		F fl T no T
Frostnip	Possible itching or pain	Skin turns white	Exposure to cold (above freezing)	S
Trench Foot	Severe pain Tingling, itching	Edema Blisters Response to touch depends on depth of freezing	Exposure to cold (above freezing) and dampness	S
Chilblain	Recurrent, localized itching Painful inflammation	Swelling Severe spasms	Inadequate clothing Exposure to cold and dampness Vascular disease	R ar C
Raynaud's Disorder	Fingers tingle Intermittent blanching and reddening	Fingers blanch with cold exposure	Exposure to cold and vibration Vascular disease	R ar C

Note: Hypothermia is related to systemic cold stress, and the other disorders are related to local tissue cooling.

Symptoms of Heat Stress

The following table is reproduced from the National Safety Council's Fundamentals of Industrial Hygiene, 4th edition.

**Heat-Related Disorders Including the Symptoms, Signs, Causes, and Steps for First Aid and Prevention**

Disorder	Symptoms	Signs	Cause	First Aid
Heat Stroke	Chills Restlessness Irritability	Euphoria, Red face, Disorientation, Hot, dry skin (usually, but not	Excessive exposure; subnormal heat tolerance (genetic or	Immediate, aggressive, effective cooling. Transport to



ABC Midwest Solutions 2022 Safety Program

Disorder	Symptoms	Signs	Cause	First Aid
		always), Erratic behavior, Collapse, Shivering, Unconsciousness, Convulsions, Body temp. >104 F (40 C)	acquired), Drug /alcohol abuse	hospital. Take body temperature.
Heat Exhaustion	Fatigue Weakness Blurred vision Dizziness, headache	High pulse rate, Profuse sweating, Low blood pressure, Insecure gait Pale face Collapse Body Temp: Normal-slightly increased	Dehydration (caused by sweating, diarrhea, vomiting) Distribution of blood to the periphery Low level of acclimation Low level of fitness	Lie down flat on back in cool environment Drink water Loosen clothing
Dehydration	No early symptoms Fatigue / weakness Dry mouth	Loss of work capacity Increased response time	Excessive fluid loss caused by sweating, illness (vomiting or diarrhea), alcohol consumption	Fluid and salt replacement
Heat Syncope	Blurred vision (grey-out) Fainting (brief black out) Normal temperature	Brief fainting or near-fainting behavior	Pooling of blood in the legs and skin from prolonged static posture & heat exposure	Lie on back in cool environment Drink water
Heat Cramps	Painful muscle cramps, especially in abdominal or fatigued muscles	Incapacitating pain in muscle	Electrolyte Imbalance caused by prolonged sweating without	Rest in cool environment Drink salted water (0.5% salt solution)



ABC Midwest Solutions 2022 Safety Program

Disorder	Symptoms	Signs	Cause	First Aid
			adequate fluid and salt intake	Massage muscles
Heat Rash (prickly heat)	Itching skin Skin eruptions Reduced sweating	Skin eruptions	Prolonged, uninterrupted sweating Inadequate hygiene practices	Keep skin clean and dry. Reduce heat exposure.

Note: Salting foods are encouraged as both treatment and prevention of some heat-related disorders. Workers on salt-restricted diets must consult their personal physicians.

## 5.0 Thermal Safety Program

- **5.1 Purpose**

This program will establish guidelines and procedures for protecting exposed employees from temperature related injuries. While it applies to all ABC MIDWEST SOLUTIONS, LLC employees, those who work outdoors and in food service are most affected.

- **5.2 Policy**

ABC MIDWEST SOLUTIONS, LLC will protect the health of its employees by recognizing the risks of temperature related injuries and illnesses and controlling those risks through a combination of employee education, administrative, engineering, and protective equipment controls. The use of these controls will vary based on the work environment and needs of the employees.

- **5.3 Responsibilities**

### Environmental Health & Safety Manager

Provide technical assistance to supervisors in implementing this program.

### Supervisors

- Identify risk factors in various work environments.
- Implement work practices and other controls that minimize employee exposure.



## ABC Midwest Solutions 2022 Safety Program

- Train employees to recognize the risks, symptoms, and controls of temperature exposure, and to use self-determination to reduce their own risk.

### Employees

- Occupationally exposed employees shall attend training when offered
- Employees shall monitor their own work environment for temperature risks and take appropriate action to protect themselves.

## 6.0 Cold Stress

There are a number of methods to protect against cold stress. Supervisors should use a combination of methods, including training, to manage the effects of cold stress on employees.

### • 6.1 Training

Supervisors should inform employees of cold stress hazards when employees work in air temperatures below 41°F.<sup>2</sup> Employees exposed to cold stress shall be trained in the following.

- - Description of cold stress: Environment, clothing, and physiological responses
  - Recognition of cold-related disorders and first aid measures
  - Cold stress hygiene practices and self-determination
  - Overview of this program

### 6.2 Hygiene Practices and Self-Determination

Dehydration places a person at greater risk of cold stress. Employees should drink warm, sweet, and non-caffeine containing drinks to remain hydrated.

It is also important to eat a normal, well-balanced diet.

Employees who experience extreme discomfort or symptoms of cold stress should stop work and seek a place to warm themselves. Employees should replace wet clothing immediately.





## ABC Midwest Solutions 2022 Safety Program

Employees with chronic illnesses or risk factors, such as cardiovascular disease or diabetes, should consult their physician regarding their exposure to cold at work. The employee shall provide his/her supervisor with written documentation from the physician indicating any limitations necessary to conduct their work safely.

### 6.3 Engineering Controls

Portable outdoor heaters are acceptable warming devices when used in accordance with equipment instructions. Gas-fired heaters must not be used in an enclosed area to reduce the possibility of exhaust gas poisoning. Heaters that are “on” must be attended at all times and must be turned off when unattended to limit fire hazard. They may not be used under conditions that could cause a heater to tip over, such as while driving.

Use insulated or non-metal tools. Steel conducts heat away from the body faster than water.

### 6.4 Administrative Controls

When the risk of cold exposure is high, supervisors should encourage frequent breaks in the work routine. Breaks are an opportunity to warm up the body in a temperature-regulated environment.

Whenever possible, supervisors should schedule outdoor or cold work during the warmest periods of the day. Avoid or limit periods of sedentary work effort.

Encourage employees to self-pace and to monitor their own health. Encourage them to leave the cold environment when feeling symptoms of cold stress.

### 6.5 Protective Clothing

Employees should wear dry, layered clothing to keep the body warm. Moisture conducts heat away from the body 25 times faster than air, increasing the potential for cold stress. Employees should prepare to change wet clothing during the workday.

Prevent clothing from becoming externally wet by using rain gear, to shed moisture. Waterproof footwear is also essential for protecting against the cold.

Sweat may also cause the body’s temperature to decrease. Clothing, including those made from polypropylene materials, that pull moisture away from the skin is recommended.

Wear a hat. Up to 50% of heat loss is through the head, ears and back of neck.



## ABC Midwest Solutions 2022 Safety Program

Cover all exposed skin to prevent chilblain (permanently damaged red and itchy skin) injuries. Wear gloves when the air temperature is less than 61°F for light work. Mittens are even better when manual dexterity is not required.

It is the employee's responsibility to provide clothing that is "personal in nature and may be used by workers off the job"<sup>3</sup>. This includes waterproof footwear or cold-weather wear. Supervisors must provide other personal protective equipment.

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<sup>2</sup> Thomas E. Bernard, PhD, CIH, "Thermal Stress," *Fundamentals of Industrial Hygiene, 4th ed.* (National Safety Council, 1996) pp. 319-345.

<sup>3</sup> Michael Wood, "WISHA Interim Interpretive Memorandum #96-9-C Personal Protective Equipment Assessment, Training & Payment," (September 27, 1996).

### 7.0 Heat Stress Program

Requirements apply to outdoor work environments from May 1 through September 30, annually, when employees are exposed to outdoor heat at or above an applicable temperature listed in Table 1.

To determine which temperature applies to each worksite, select the temperature associated with the general type of clothing or personal protective equipment (PPE) each employee is required to wear.

#### Table 1 – Outdoor Temperature Action Levels

All other clothing
Double-layer woven clothes including coveralls, jackets and sweatshirts
Nonbreathing clothes including vapor barrier clothing or PPE such as chemical resistant suits

Supervisors should implement a combination of administrative, engineering, and protective equipment controls to minimize heat related injuries. They should also train employees to protect themselves against heat stress.

- **7.1 Training**

Employees at risk of heat stress shall be trained in the following topics.



## ABC Midwest Solutions 2022 Safety Program

- - Description of heat stress: Environment, work demands, clothing, and physiological responses, including acclimation
  - Recognition of heat-related disorders and first aid measures
  - Heat stress hygiene practices and personal responsibility
  - Overview of this program

### **7.2 Hygiene Practices and Self Determination**

Dehydration is associated with heat stress. Employees should drink about one cup of fluids every 20 minutes. Cool water, artificially flavored lemonade, or commercial fluid-replacement drinks are suitable. Avoid alcohol, coffee, tea, and soft drinks containing caffeine as they may cause dehydration.

Employees should eat healthy, light meals at breaks and get adequate sleep to decrease the effects of heat stress.

It is the employee's responsibility to stop the work or leave the heated environment at the first symptom of a heat-related disorder. The employee must also carry out a pace of work that reduces the effects of heat stress.

Employees with chronic illnesses, such as heart, lung, kidney, or liver disease should consult their physician regarding their exposure to heat at work. The employee shall provide his/her supervisor with written documentation from the physician indicating any limitations necessary to conduct their work safely.

Employees should protect their skin from injury by using a sunscreen. Sunburn makes the body's job of heat dissipation much more difficult.

### **7.3 Engineering Controls**

Whenever possible, departments will substitute power tools or other processes to reduce employee physical exertion or work demand.

Use personal fans to increase airflow. Good airflow evaporates sweat, which cools the skin. However air movement in environments more than 104°F may actually increase overall heat stress.

### **7.4 Administrative Controls**

Whenever possible, supervisors should schedule the heaviest or hottest work during the cooler parts of the day and encourage short, frequent work-rest cycles to



ABC Midwest Solutions 2022 Safety Program

allow employees to drink and cool down. Encourage employees to take breaks in cooled environments whenever possible.

Supervisors should also pace the assignment of work so that the rate of metabolism, which contributes to heat stress, is maintained at a healthy level. Assign work to be shared by workers. Monitor workers for signs and symptoms of heat stress.

Encourage employees to utilize self-determination to control heat stress. They should monitor their own health and remove themselves from the environment as needed.

For new employees or employees returning from time off, implement a work schedule that allows the individual to build up a tolerance to hot conditions.

Heat Acclimation Schedules

The following acclimation schedules are reproduced from the National Safety Council’s Fundamentals of Industrial Hygiene, 4th edition.

**Basic Acclimation Schedule**

<b>Basic Acclimation Schedule Day</b>	<b>Activity (% of full work assignment)</b>
	<i>Experienced</i>
Day 1	50%
Day 2	60%
Day 3	80%
Day 4	100%
Day 5	

**Schedule for Re-acclimation after Periods Away from Heat Stress Exposures Due to Routine Absence or Illness Re-Acclimation Schedule**

<b>Days Away from Heat-Related Schedule</b>	<b>Exposure Sequence (% of full work)</b>		
<i>Routine Absence</i>	Illness	Day 1	Day 2



Days Away from Heat-Related Schedule		Exposure Sequence (% of full work	
<4	-	100%	
4-5	1-3	R/E*	100%
6-12	4-5	80	100%
12-20	6-8	60	80
>20	>8	50	60

\* Reduce expectations, some diminished capacity

### 7.5 Protective Clothing

Employees should wear light-colored, lightweight, loose-fitting, natural fiber clothing. Select clothing that is permeable, does not insulate, and allows vapor movement.

There are also personal protective equipment products that can be worn to reduce the effects of heat. Try a reflective vest when working in the sun or near a heat source or ice/water-cooled bandanas or vests.

As with cold stress protective clothing, it is the employees responsibility to provide clothing that is “personal in nature and may be used by workers off the job”. Supervisors must provide other personal protective equipment.

Refrain from wearing frayed, torn, or loose-fitting clothing, jewelry, thong-type sandals, athletic/sport shoes, or long unrestrained hair near moving machinery or other potential sources of entanglement, or around electrical equipment.



# ABC Midwest Solutions 2022 Safety Program

### HEAT EXHAUSTION

**What happens to the body:**

Headaches, dizziness, or light-headedness, weakness, mood changes, irritability or confusion, feeling sick to your stomach, vomiting, fainting, decreased and dark-colored urine, and pale, clammy skin.

**What should be done:**

- Move the person to a cool, shaded area. Don't leave the person alone. If the person is dizzy or light-headed, lay him on his back and raise his legs about 6-8 inches. If the person is sick to his stomach, lay him on his side.
- Loosen and remove heavy clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if he is not feeling sick to his stomach.
- Try to cool the person by fanning him. Cool the skin with a cool spray mist of water or wet cloth.
- If the person does not feel better in a few minutes call for emergency help (ambulance or 911).

If heat exhaustion is not treated, the illness may advance to heat stroke.

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### HEAT STROKE - A Medical Emergency

**What happens to the body:**

Dry, pale skin, sweating may still be present; hot, red skin (looks like a sunburn); mood changes; irritability, confusion, and not making any sense; seizures or fits, and collapse (will not respond).

**What should be done:**

- Call for emergency help (ambulance or 911.)
- Move the person to a cool, shaded area. Don't leave the person alone. Lay him on his back and if the person is having seizures; remove objects close to him so he won't hit them. If the person is sick to his stomach, lay him on his side.
- Remove heavy and outer clothing.
- Have the person drink small amounts of cool water if he is alert enough to drink anything and not feeling sick to his stomach.
- Try to cool the person by fanning him or her. Cool the skin with a cool spray mist of water, wet cloth, or wet sheet.
- If ice is available, place ice packs in armpits and groin area.

### PREVENTING HEAT-RELATED ILLNESS

- Drink a lot of water, about 1 cup every 15 minutes.
- Know the signs/symptoms of heat-related illness; monitor yourself and co-workers.
- Block out direct sun or other heat sources.
- Use cooling fans/air-conditioning; rest regularly.
- Wear lightweight, light colored, loose-fitting clothes.
- Avoid alcohol, caffeinated drinks, or heavy meals.



Washington State Department of Labor & Industries  
Division of Occupational Safety and Health

-8-

Pacific Lutheran University - 2011



## 16. Tools, Equipment and Construction Safety

### Tools, Equipment, and Construction Safety

#### 1.0 General Protection

Employees must utilize machinery, tools, materials, or equipment, whether owned by the employee or the University, in accordance with the safety or health requirements of this program or any applicable Wisconsin Administrative Code (WAC).

Selecting the proper tool or piece of equipment for a particular job is an important step in maintaining a safe work place. Tools and equipment must be used in accordance with the manufacturer's designed or intended purpose.

#### 2.0 Hand and Power Tools

Employees will use proper tools suitable to the job being done. Only tools in good repair may be kept or used on the premises or on the job. Employee-owned tools must meet all safety requirements, whenever used for work. Guards must be in place when so designed.

- **2.1 Hand Tools**

Use the proper tool for the job. When possible, purchase tools with ergonomic features. The following guidelines apply to all tools and equipment, and to their operation.

- Cutting tools must be kept sharp. It is the responsibility of the employee using the tool to keep the tool sharp. Exercise caution when using sharp cutting instruments, especially when encountering resistance. When possible, cut away from the body.
- Hammers and other tools having separable handles must have the handle securely fastened to the tool.
- Wrenches having jaw openings at right angles or less than 180 degrees to the handle must be placed on the nut with the jaw opening in the direction the handle is to move. Use the correct size wrench and test for slippage on the nut before exerting pressure. Do not use a piece of pipe or a "cheater" to extend the handle for leverage; use a larger wrench. Be aware of equipment torque specifications. Wrenches with cracked or spreading jaws must not be used. Damaged wrenches must be removed from service or repaired according to the manufacturers specifications.



### ABC Midwest Solutions 2022 Safety Program

- The tips of screwdriver blades must be sharpened and properly dressed to fit screw slots. A screwdriver must not be used as a cutting tool.
- Tools with heads that have mushroomed from repeated hammering must not be used. Remove such tools from service.
- Powder/Fuel Actuated Tools- No employee may operate a power or fuel actuated tool without a valid operator's license (where required) and training.
- Anticipate the path that a utility knife might take and place your hands and body in a safe position before starting. Injuries can be avoided by cutting away from yourself and others.
- Power tools shall be equipped with on-off or constant pressure switch as designed.

#### 2.2 Insulation and Electrical Work

- Handles of tools, such as pliers and screwdrivers may be covered with insulation to improve grip or to avoid unexpected electrical shorts, but this covering must not be relied on for insulation or protection against personal injury on voltages above 250 volts.
- Screwdrivers having metal shanks extending through the handles must not be used for electrical work.
- Metallic tapes or metallic rules must not be used near electrical

#### 2.3 Tool Storage

Tools temporarily stored or laid aside on the job must be placed so as not to create a stumbling or falling hazard. They may not be left on ladders or in traffic areas. Tools with sharp edges must be covered or stored in such a way as to guard against a cutting hazard.

Particular care must be used when working in an elevated position. Tools must not be left unsecured, but should be kept in containers.

Tools must be stored in such a manner as to prevent them from becoming damaged.

### 3.0 Electrical Powered Tools and Equipment





## ABC Midwest Solutions 2022 Safety Program

Electric power-operated tools must either be of the approved double-insulated type or be grounded.

Portable ground fault circuit interrupters (GFCI's) must be installed in wet locations during water damage remedial response and when there are new or remodel construction projects.

The use of electric cords for hoisting or lowering tools is not permitted.

- **3.1 Extension Cords and Trouble Lights**

Extension cords used for lighting supply must have conductors enclosed in common rubber sheaths and must be waterproofed for their entire length except at terminals. Ordinary twisted lamp cords and metallic sockets do not meet these requirements. Lamps for trouble lights must be enclosed in guards.

Lamp guards on trouble lights must be gas-proof when used in potentially explosive atmospheres. Lamp guards on trouble lights used in locations with exposed electrical contact points must be of non-conducting material.

- **3.2 Electrical Power Cords**

- - All power cords must be of the three-conductor type with proper ground ABC Midwest Solutions, LLC (UL approved) enclosed in common rubber waterproof sheaths.
  - All power tools must be insulated and grounded with three-conductor type cords and ground ABC Midwest Solutions, LLC.
  - The ground connection on the power ABC Midwest Solutions, LLC must not be cut off or removed at any time.
  - Extension cords that are frayed, worn or that have missing ground prongs must be removed from service. Extension cords must have sufficient capacity rated in amps or volts for the rating on the portable power electric tool to be used.
  - The use of cheater ABC Midwest Solutions, LLC, also known as ground-lifters, is prohibited. If a work location does not have a three-wire grounded receptacle available, replacement of the receptacle by an electrician should be requested.

- **3.3 Portable Electric Tools**



## ABC Midwest Solutions 2022 Safety Program

- - Electric cords supplying portable power tools must be rubber sheathed with adequate terminal connections, and must include a ground wire attached to the tool casing and to an outlet ground or other low resistance ground.
  - Portable electric power tools must be grounded. If double insulated tools are used, they must be distinctively marked.
  - The user must thoroughly inspect portable electric power tools and cords before use. Extension cords must not be used in place of fixed wiring.
  - Employees using portable electric power tools should first assure themselves of a firm stance, and secure the piece being worked on in such a way as to prevent unexpected turning or other movement.
  - Portable electric power tools with frayed or worn cords, missing ground prongs, or with loose or worn parts must be removed from service.

### **4.0 Assured Equipment Grounding Program**

The purpose of this program is to establish procedures to test, identify hazards, and maintain (in safe operating condition), all cords, cord sets, ABC Midwest Solutions, LLC, and electrical equipment connected by a cord.

A copy of this program, including the specific procedures adopted by the University must be available at the job site for inspection.

Sub contractors are also responsible for implementing and supervising all elements of this program including the required testing and inspections.

- **4.1 GFCI's In Place of Assured Equipment Grounding Program**

Cord sets equipped with GFCI's do not need to be checked as a part of an assured equipment grounding program. Departments or employees who wish to avoid the process of having to inspect cord sets may do so by replacing them with GFCI equipped cord sets.

All 120 volt single phase 15 and 20 ampere receptacle outlets on a particular site, which are not part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground fault circuit interrupters for personal protection. Receptacles on a two wire single phase portable or vehicle mounted generator rated not more than 5 kW, when the circuit conductors are



## ABC Midwest Solutions 2022 Safety Program

insulated from the generator frame and all other grounded surfaces, need not be protected with ground fault circuit interrupters.

### 4.2 Daily Inspections

The employee using the equipment will visually inspect each cord set, attachment cap, ABC Midwest Solutions, LLC and receptacle of cord sets, and any equipment connected by cord and ABC Midwest Solutions, LLC, except cord sets and receptacles which are fixed and not exposed to damage before each days use. The employee will look for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective must be removed from service and repaired or destroyed.

### 4.3 Test Procedures

The following three tests shall be performed on cord sets or receptacles that are not a part of the permanent wiring of the building or structure and cord-connected and ABC Midwest Solutions, LLC-connected equipment that is required to be grounded:

- All equipment grounding conductors shall be tested for **continuity** and shall be electrically continuous.
- Each receptacle and attachment cap or ABC Midwest Solutions, LLC shall be tested for correct **attachment** of the equipment-grounding conductor. The equipment-grounding conductor shall be connected to its proper terminal.
- Each outlet receptacle or power source shall be tested to ensure proper **polarity**.

## 5.0 Accident Prevention Tags

- Do not use any machinery, tool, material, or equipment that is not in safe operating condition.
- Unsafe machines, tools, materials, or equipment must be identified as unsafe by tagging or locking the controls (if applicable) and notifying the supervisor
- The tag should indicate the name of the person placing the tag, the nature of the problem, and the date. When the unsafe condition is corrected the tag and/or lock can be removed and the tool or equipment returned to service.

## 6.0 Power Equipment



## ABC Midwest Solutions 2022 Safety Program

Power equipment must be used in a manner consistent with the manufacturer's recommendations. Supervisors must read and be completely familiar with the manufacturer's operating instructions and recommended safety procedures. Because of the hazards inherent with power equipment, supervisors must verify that an employee has been properly trained on a piece of equipment before permitting that employee to use it. Equipment must be shut off when left unattended.

- **6.1 Bench Grinder**

The tool support must be positioned at or above the center line of the wheel and be kept as close to the wheel as possible without touching, but never more than 1/8 inch away. Use the face and not the side of the wheel for grinding. The grinding wheel must be checked for cracks, breaks, or defects. Defective wheels shall be taken out of service and reported to the supervisor. Small items shall be held with pliers to keep hands away from the wheel. A tongue guard must be in place on each pedestal or bench grinder. The tongue guard is located above the tool rest and must be positioned less than one-fourth (1/4th) of an inch from the surface of the wheel. Bench grinders must be securely anchored.

### **6.2 Portable Grinders**

Immediately before mounting, all grinding wheels must be closely inspected and sounded by the user to make sure they have not been damaged in transit, storage, or otherwise, before they are mounted. They should be tapped gently with a light, non-metallic implement, such as the handle or a screwdriver for light wheels, or a wooden mallet for heavier wheels. This is known as the "ring test." If wheels sound cracked (dead) they must not be used.

### **6.3 Drill Press**

A few safety precautions must be remembered while operating a drill press.

- Know your drill press. Read the owner's manual very carefully. Learn its applications and limitations, as well as the specific potential hazards peculiar to it
- Always wear safety glasses or a face shield.
- Be sure that the chuck key is removed from the chuck before turning on the power. Using a self-ejecting chuck key is a good way of insuring that the key is not left in the chuck accidentally. To avoid accidental starting, make sure the switch is in the OFF position before plugging in the cord. Always disconnect the drill from the power source when making repairs.



#### ABC Midwest Solutions 2022 Safety Program

- Never attempt to use a hand auger bit in a drill press. Use only drills and bits designed for machine use. Consult the owner's manual for recommended accessories. The use of improper accessories may present hazards.
- Hold the work piece firmly so that it will not fly or spin off the table. It is generally best to fasten the work piece securely with clamps or hold it in a vise. This is especially true when drilling or boring small work pieces.
- Keep the guard on the spindle pulley to prevent your hair and clothing from getting caught. No loose clothing, gloves or jewelry may be worn when working on the drill press. A hair net is required for long hair. See the Personal Protection section.
- Use the recommended spindle or chuck. Most operations can be done successfully with the 0 to ½ in. capacity geared drill chuck.
- Be sure the drill bit or cutting tool is locked securely in the chuck. Remember that all adjustments should be made with the power off.
- Adjust the table so that the hole in the table center is beneath the drill, or set the depth stop to avoid drilling into the table. It is a good idea to place a piece of wood beneath the work piece to prevent this.
- Do not use too high a spindle speed. Use the recommended speeds. If there is any doubt, use the lower speed. The wrong application of high speed can burn up the cutting tool and/or work pieces, and can hurl the work off the table with considerable force. A speed that is too slow with a heavy feed can cause the tool to dig into the work piece, which can stall the motor or break the cutting edges. Always disconnect the machine from the power source when changing speeds or making adjustments.
- On deep cuts, raise the bit frequently to clean the chips out of the hole. If the drill becomes stuck in the hole, turn off the machine before attempting to raise the bit.
- Use a brush to keep the table and work piece free of sawdust or chips. Always disconnect the machine from the power source before cleaning.
- When using sanding drums and other abrasive accessories, make sure the work area is well ventilated.
- Never try to stop the machine by grabbing the chuck after the power is turned off. Do not run the tool unattended. Turn off the power, and



## ABC Midwest Solutions 2022 Safety Program

do not leave the drill press until the chuck comes to a complete stop.  
Drill press must be securely anchored.

### 6.4 Power Cutoff Saw

Approved eye protection and ear protection must be worn when performing operations using a power cutoff saw, or when working in close proximity to a power cutoff saw or grinder.

The upper hood must completely enclose the upper portion of the blade down to a point that will include the end of the saw arbor. The sides of the lower exposed portion of the blade must be guarded to the full diameter of the blade by a device that will automatically adjust itself to the thickness of the stock and remain in contact with stock being cut to give the maximum protection possible for the operation being performed.

### 6.5 "Skill" or Chain Saws

All hand-held power circular saws having a blade diameter greater than two inches and that lack positive accessory holding means must be equipped with a constant pressure switch or control that will shut off the power when the pressure is released. All hand-held gasoline powered chain saws must be equipped with a constant pressure throttle control that will shut off the power to the saw chain when the pressure is released.

Chaps, hearing and eye protection must be worn when using a chain saw.

### 6.6 Bandsaw

The guard must be kept in proper condition. All portions of the saw blade must be enclosed or guarded, except for the working portion of the blade between the bottom of the guide rolls and the table. Bandsaw wheels must be fully encased. The front and back of the band wheels must remain enclosed by solid material, or by wire mesh, or perforated metal. Such mesh or perforated metal must be no less than 0.037 inch (U.S. Gage No. 20), and the openings must be no greater than three-eighths inch. Bandsaw must be securely anchored.

Solid material used for this purpose will be of an equivalent strength and firmness. The guard for the portion of the blade between the sliding guide and the upper-saw-wheel guard will protect the saw blade at the front and outer side. This portion of the guard must be self adjusting to raise and lower with the guide. The upper-wheel guard must conform to the travel of the saw on the wheel, and the top member of the guard should have at least a two inch clearance outside the saw and be lined with smooth material, preferably metal. Effective brakes should be provided to stop the wheel in case of blade breakage.



## ABC Midwest Solutions 2022 Safety Program

The bandsaw must have a tension control device to indicate a proper tension for the standard saws used on the machine. This will help eliminate saw breakage due to improper tension.

Feed rolls of bandsaws must be protected with a suitable guard to prevent the hands of the operator from coming in contact with the in-running rolls at any point. The edge of the metal guard must come to within three-eighths inch of the plane formed by the inside face of the feed roll in contact with the stock being cut.

### 6.7 Batteries

Because explosive fumes may be emitted during charging or operating batteries, all potential sparks or flames must be kept away from the top of any liquid cell battery. Do not disconnect the cables while the charger is running. Smoking is not permitted in the vicinity of a battery that is being charged. Proper eye and hand protection must be worn when re-filling cells.

## 7.0 Fixed and Portable Woodworking Machines

This section applies to the use of fixed and portable power tools for processing materials that generate chips or dust from wood, reconstituted wood products, or plastics.

- **7.1 Definitions**

Point of operations means that point at which cutting, shaping, boring, or forming is accomplished upon the stock.

Push stick means a narrow strip of wood or other soft material with a notch cut into one end that is used to push short or narrow pieces of material through saws.

Block means a short block of wood, provided with a handle similar to that of a plane and a shoulder at the rear end, which is used for pushing short stock over revolving cutters.

Jigs and Fixtures are devices for holding, supporting, or restraining material from movement while operations are being performed.

### 7.2 General Woodworking Machine Construction

- - Each machine should be so constructed as to be free from sensible vibration when the largest tool is mounted and run idle at full speed.
  - Arbors and mandrels should be constructed so as to have firm and secure bearing and be free from play.



### ABC Midwest Solutions 2022 Safety Program

- Saw frames or tables should be constructed with lugs cast on the frame or with an equivalent means to limit the size of the saw blade that can be mounted, so as to avoid excessive speed caused by mounting a saw larger than intended.
- Circular saw fences should be so constructed that they can be firmly secured to the table or table assembly without changing their alignment with the saw. For saws with tilting tables or tilting arbors the fence should be so constructed that it will remain in a line parallel with the saw, regardless of the angle of the saw with the table.
- All belts, pulleys, gears, shafts, and moving parts should be guarded.
- When possible, each power-driven machine should be provided with a disconnect switch that can be locked in the off position.
- The frames and all exposed, non-current-carrying metal parts of portable electric machinery operated at more than 90 volts to ground should be grounded. Other portable motors driving electric tools that are held in the hand while being operated should be grounded if they operate at more than 90 volts to ground. The ground should be provided through a separate ground wire and polarized plug and receptacle.
- Combs (feather boards) or suitable jigs should be provided at the workplace for use when a standard guard cannot be used, as in grooving, jointing, molding, and rabbeting.

#### 7.3 Table Saw

The table saw guard must completely enclose that portion of the saw above the table and that portion of the saw above the material being cut. The hood and mounting must be arranged so that the hood will automatically adjust itself to the thickness of the material being cut and remain in contact with it without offering any considerable resistance to the insertion or passage of material being sawed.

The hood must be strong enough to resist blows and strains incidental to reasonable operating, adjusting, and handling. It must also protect the operator from flying splinters and broken saw teeth. It must be made of material that is soft enough so that it will be unlikely to cause tooth breakage. The material should not shatter when broken, should be non-explosive, and should be no more flammable than wood. The hood must be so mounted as to ensure that its operation will be positive, reliable and in true alignment with the saw. The mounting must be adequate in strength to resist any reasonable side thrust or other force tending to throw it out of line.





## ABC Midwest Solutions 2022 Safety Program

***Unusual Shapes:*** When a hood-type guard cannot be used because of unusual shapes or cuts, a jig or fixture that will provide equal safety for the operator must be used. Combs (feather boards) or suitable jigs must be used when a standard guard cannot be used, as in grooving, jointing, molding, and rabbeting. On the completion of such operations, the guard must be immediately replaced.

***Push Stick:*** A push stick must be used on short or narrow stock or when there is a possibility of the hand contacting the blade.

***Spreader and Anti-kickback Devices:*** Each table saw should be furnished with a spreader to prevent material from squeezing the saw or being thrown back on the operator. The spreader should be made of hard tempered steel or its equivalent and should be thinner than the saw kerf. It should be of sufficient width to provide adequate stiffness or rigidity to resist any reasonable side thrust or blow tending to bend or throw it out of position. The spreader should be attached so that it will remain in true alignment with the saw even when either the saw or table is tilted and should be placed so that there is not more than one-half (1/2) inch space between the spreader and the back of the saw when the largest saw is mounted in the machine. The provision of a spreader in connection with grooving, or rabbeting is not required. On the completion of such operations, the spreader should be immediately replaced.

### 7.4 Jointer

The planer or jointer cutting head knife must not project out greater than one-eighth (1/8th) inch beyond the cylindrical body of the head.

The opening in the table must be kept as small as possible. The clearance between the edge of the rear table and the cutter head must not be more than one-eighth inch. The table throat opening must not be more than two and one-half inches when tables are set or aligned with each other for zero cut.

The jointer guard must cover all the section of the head on the working side of the fence or gage. The guard must effectively keep the operator's hand from coming in contact with the revolving knives. The guard must automatically adjust itself to cover the unused portion of the head and must remain in contact with the material at all times.

The jointer guard must cover the section of the head back of the gage or fence.

### 7.5 Lathe

Safe, effective use of a wood lathe requires study and knowledge of procedures for using this tool. Read and thoroughly understand the owner / operators manual.



## ABC Midwest Solutions 2022 Safety Program

Always wear safety goggles or safety glasses that include side protectors and a full face shield when needed.

Tie back long hair. Do not wear gloves, loose clothing, jewelry or any dangling objects that may catch in rotating parts or accessories.

Check the owner / operator's manual for proper speed recommendations. Use slower speeds for larger diameter or rough pieces and increased speed for smaller diameters and pieces that are balanced.

Make certain that the belt guard or cover is in place. Check that all clamping devices (locks), such as on the tailstock and tool rest are tight.

Check the speed, drill bit or tool to make sure it matches the size, thickness or type of material being machined. Drill bits and cutting tools must be kept sharp with a proper angle on the cutting edge. Improper speed may break, overheat or damage the bit or tool.

### 7.6 Press Operations

Presses must be operated in accordance with the manufacturer's recommendations. Presses must be clearly marked with the manufacturer's stated load capacity and the rating must be visible from the point of operation. Hazards include danger from flying pieces of parts that may have shattered or slipped out under great pressure.

**Protection of operators.** Operators must stand in a position or be shielded by a guard from possible injury due to failure of the press, failure of the work material or other operational hazards.

**Instruction to operators.** Operators must be trained and instructed in the safe methods of operation before starting work on a press. The employee will be supervised to insure correct use of safe procedures.

**Work area.** Employees must maintain adequate clearance between machines so that movement of one operator will not interfere with the work of another. Ample room for cleaning machines, handling material, work pieces, and scrap must also be maintained. All surrounding floors must be kept in good condition and free from obstructions, grease, oil and water.

**Overloading.** Presses may only be operated within the tonnage and weight ratings specified by the manufacturer.

**Freedom from movement.** Work being pressed must be free from slippage or unintended movement.



### 7.7 Radial Arm Saws

The radial arm saw may be guarded with a fixed enclosure, fixed barrier guard, or a manually adjusted guard or a standard automatic adjusting guard. In those instances where an alternate fixed-type guard is used, it must provide protection equivalent to the protection afforded by the automatically adjusting guard.

The upper hood should completely enclose the upper portion of the blade down to a point that will include the end of the saw arbor. The upper hood should be constructed in such a manner and of such material that it will protect the operator from flying splinters, broken saw teeth, etc., and will deflect sawdust away from the operator. The sides of the lower exposed portion of the blade should be guarded to the full diameter of the blade by a device that will automatically adjust itself to the thickness of the stock and remain in contact with stock being cut to give maximum protection possible for the operation being performed.

An adjustable stop should be provided to prevent the forward travel of the blade beyond the position necessary to complete the cut.

Installation should be in such a manner that the front end of the unit will be slightly higher than the rear, so as to cause the cutting head to return to the starting position in the following manner when released by the operator:

- The cutting head or carriage should return to the rest or starting position in a gentle motion
- The cutting head or carriage should not bounce or recoil when reaching the rest or starting position
- The cutting head or carriage will remain in the rest or starting position

Each radial arm saw used for ripping should be provided with non-kick-back fingers or dogs located on both sides of the saw so as to oppose the thrust or tendency of the saw to pick up the material or to throw it back toward the operator. They should be designed to provide adequate holding power for all the thickness of material being cut. Ripping and ploughing must be against the direction in which the saw turns. The direction of the saw rotation must be conspicuously marked on the hood. In addition, a permanent label not less than 1 ½ inches by ¾ inch with standard proportional lettering should be affixed to the rear of the guard hood at approximately the level of the arbor, where the blade teeth exit the upper hood during the operation of the saw, reading as follows: "Danger: Do not rip or plough from this end." The label color shall be danger red.

### 8.0 Ladders



## ABC Midwest Solutions 2022 Safety Program

Departments are encouraged to purchase fiberglass ladders over wood ladders because they do not damage as easily. Always inspect a ladder carefully prior to use. Never use a ladder that you believe is unsafe. Always face the ladder while ascending or descending it. Never carry materials or tools while climbing or descending a ladder except in a tool pouch. Always be certain that shoes are free of mud and grease to prevent slips and falls. Ladders must never be lengthened by splicing additional sections to them. The only ladder that can be spliced is a fixed ladder that is permanently installed to a structure. Unattended ladders should be closed and lowered to the ground or floor.

- **8.1 Ladder Working Loads**

Ladders shall be capable of supporting the following loads without failure:

**Self-supporting portable ladders.** At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladder shall sustain at least 3.3 times the maximum intended load.

**Portable ladders that are not self-supporting.** At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladders shall sustain at least 3.3 times the maximum intended load.

**Fixed ladders.** At least two loads of 250 pounds each, concentrated on two consecutive places of attachment. Each step or rung shall be capable of supporting a single concentrated load of at least 250 pounds.

**General ladder ratings** are as follows:

Type	Duty Rating	Working Load
IAA	Industrial	Special duty - 375 lbs. Maximum
IA	Industrial	Extra heavy - 300 lbs. Maximum
I	Industrial	Heavy - 250 lbs. Maximum
II	Commercial	Medium - 225 lbs. Maximum
III	Household	Light - 200 lbs. maximum

### 8.2 Stepladders

A stepladder provides a reasonably stable base for carrying on work when both hands are used. It is usually equipped with a pail shelf for tools and materials. The



## ABC Midwest Solutions 2022 Safety Program

steps of the ladder in most cases are flat and wide enough for comfortable standing. These ladders are self supporting with wide spread bases.

Stepladders should be used only if the space in which the ladder is placed is sufficiently large to permit the proper placement of the ladder

A stepladder is a temporary elevated base from which to work. It should not be used to move between different levels. Inspect all ladders prior to use.

Proper use means adhering to the following:

- The ladder shall be placed on a firm, level base. If this requires blocking, then the blocking and the ladder must be firmly tied or anchored together.
- The ladder should be placed so that the work can be done without leaning or stretching past the side rails.
- All stepladders should be opened fully so that the spreaders lock themselves in the open position.
- If it is necessary to reach a greater height, use a longer ladder. It is dangerous to use boxes or other items to increase the height of a ladder.
- Unless a ladder is equipped with a top platform and guardrails, operations must be conducted from no higher than two steps from the top of the ladder.
- Tools and materials should be removed from the top and pail shelf before the worker descends. Nothing should ever be left on a ladder.

### 8.3 Straight, Extension, and Fixed Ladders

Straight or extension ladders are used in places where a stepladder cannot be used due to limited space and heights greater than a stepladder can provide. A straight ladder may not exceed thirty feet in length.

Proper use means adhering to the following:

- The procedures for the inspection and placement of stepladders apply to straight ladders. There is, however, an additional factor in placing a straight ladder properly. The base of a straight ladder must be placed at a distance from the vertical wall equal to one fourth the working length of the ladder. For example, if the ladder is placed at a



## ABC Midwest Solutions 2022 Safety Program

working height of 16 feet, it shall be four feet away from the vertical wall.

- Ladders must be long enough to extend at least 3 (three) feet above the top landing.
- Straight ladders must always be placed so that the top of the two rails are against a solid support. They should be lashed, preferably at top and bottom, to prevent movement. If it is not possible to lash the ladder in position, a helper must hold the ladder firmly.
- When it is necessary to work from a straight ladder, the highest level one may work from is the third rung from the top of the point where the ladder contacts the vertical surface.
- In dangerous situations, a ground person should act as a spotter for foot traffic, powered industrial trucks (forklift) or other vehicles.
- Keep hands and fingers in the clear at all times to avoid crushing.

### 8.4 Ladder Inspection

Guidelines for proper inspection and maintenance of stepladders are as follows:

- Be sure that hinge spreaders are securely fastened to the ladder and can be opened to the fullest extent without binding.
- Inspect steps to be certain that they are tight. A loose step is one that can be moved, even slightly, by hand.
- See that the ladder doesn't wobble or shake due to damage and side strain.
- Check safety feet for proper condition.

Guidelines for proper inspection and maintenance of extension or straight ladders are as follows:

- Before using a ladder, carefully inspect it to determine whether it is in sound condition. If there is any defect no matter how slight, withdraw it from use immediately. Have the ladder inspected by a qualified person, and if it cannot be placed in perfect condition, destroy it. Substandard ladders must never be kept.
- Inspect the rails and rungs to be certain that they are not cracked, split or broken. Repair splintered or splintered areas.



### ABC Midwest Solutions 2022 Safety Program

- Check the extension locks and pulley. A lock that is defective must be replaced. Check the rung sections exposed to wear by the action of the extension locks. See that the safety feet are in good condition and operating properly.
- Determine that the extension locks are securely fastened in position to the side rail. If there is any indication that the side rail splitting at the bolt or rivet holes, remove the ladder from service.
- Inspect the connecting joints of sectional ladders. The metal plate of the grooved ends of the sections should be rigidly secured in position, and the rivet or bolt should be positioned firmly.
- Check the outside rung extensions at the top of each section to determine that there is no deterioration, cracking, or loosening of the rung. All members of each section and its support should be sound and firmly secured.
- All portable ladders should be kept coated with a protective material such as paint, varnish, or lacquer. Paint may only be a satisfactory coating for a new ladder when a careful inspection is made by an experienced person and the ladder is not to be sold. Ladders may not be placed in front of doors opening toward the ladder unless the door is blocked open, locked shut, or guarded by a worker.

## 9.0 General Hoisting Requirements

Only trained, designated personnel are permitted to operate cranes, cherry pickers, Genie lifts, articulated arm vehicles, boom hoists, or similar equipment. These employees must also be completely familiar with the manufacturer's recommendations concerning safe operating procedures. Operators must follow manufacturer's recommendations completely.

Prior to initial use, equipment must be inspected to ensure that it is safe and in proper operating condition. The rated capacity can be found in the state code and its subsections. Rated capacity of slings, ropes, and equipment must not be exceeded. The rated capacity of a rope or sling often is reduced to 50% when the angle of loading approaches 60 degrees from the vertical. The tables in the state code, Part D must be consulted to determine actual capacities for different ropes or configurations. This Wisconsin State Code can be obtained from the Environmental Health and Safety Manager.

- **9.1 Maintenance Procedure**



## ABC Midwest Solutions 2022 Safety Program

Any unsafe conditions disclosed by an inspection must be corrected before operation of the hoist or lift is resumed. Only designated personnel may do adjustments and repairs.

After adjustments and repairs have been made the crane may not be operated until all guards have been reinstalled, safety devices reactivated, and maintenance equipment removed.

### 9.2 Load Limit

The manufacturer's recommended load limit must be clearly displayed on the hoisting device. The rated load limit must never be exceeded. The manufacturer's recommendations must be followed. Allowance must be made for windy conditions and work must be stopped when winds are severe.

### 9.3 Equipment Guards

Guards must be securely fastened. Each guard will be capable of supporting without permanent distortion, the weight of a two-hundred (200) pound person unless the guard is located where it is impossible for a person to step on it.

Railings must also be able to withstand a two-hundred (200) pound force in a horizontal direction without deflection. Railings on vertical lifts must meet the requirements of a standard guardrail. A standard guardrail consists of a top rail, intermediate rail, toe board, and posts, and has a vertical height of 36 inches to 42 inches from upper surface of top rail to the floor or platform. Each length of railing must be smooth-surfaced throughout its length. The intermediate rail is located halfway between the top rail and the floor or platform.

### 9.4 Hooks

Hooks must meet the manufacturer's recommendations and must not be overloaded. If a hook is overloaded, it will suffer deformation or distortion. The capacity of the chain/hook system is set by the manufacturer who made them and can be obtained from the supplier. Safety latch type hooks must be used.

### 9.5 Operating Near Electric Power lines

Employees, lift equipment, or devices of any kind may not approach nearer than 10 feet to any power line. For other instructions pertaining to operations near overhead electric lines see the Wisconsin State Code.

### 9.6 Fire Extinguishers

A fire extinguisher (carbon dioxide, dry chemical, or equivalent) must be kept in the truck cab or vicinity of lift equipment. Operators and maintenance personnel will be





## ABC Midwest Solutions 2022 Safety Program

made familiar with the use and care of the fire extinguishers provided. To schedule fire extinguisher training, contact the Environmental Health & Safety Manager.

### 9.7 Operators

Training is required before personnel may operate any aerial lift equipment. Each operator must be familiar with the manufacturer's recommendations, safe practices, and equipment limitations. Refresher training may be required.

### 9.8 Steel Chains

Chains used for overhead lifting must be made of proof-tested alloy steel. Welded alloy steel chain slings must have permanently affixed durable identification stating size, grade, rated capacity, and sling manufacturer.

Hooks, rings, oblong links, pear-shaped links, welded or mechanical coupling links, or other attachments, when used with alloy steel chains, must have a rated capacity at least equal to that of the chain. The use of job or shop hooks and links or makeshift fasteners formed from bolts, rods, or other such attachments are prohibited.

If at any time any three-foot length of chain is found to have stretched one-third the length of a link it must be discarded.

The practice of placing bolts or nails between two links to shorten chains is prohibited. Splicing broken chains by inserting a bolt between two links with the heads of the bolt and the nut sustaining the load, or passing one link through another and inserting a bolt or nail to hold it, is prohibited. Annealing of chains is prohibited.

### 9.9 Wire Rope

Only wire ropes that have a capacity exceeding 5 times the manufacturer's recommended safe working load for a particular lifting job may be used. Protruding ends of strands in splices on slings and bridles must be covered or blunted. Wire rope must not be secured by knots.

The following limitations apply to the use of wire rope:

- An eye splice made in any wire rope must have not less than three full tucks. *Note: This requirement does not preclude the use of another form of splice or connection, which can be shown to be as efficient, and which is not otherwise prohibited.*



## ABC Midwest Solutions 2022 Safety Program

- Except for eye splices in the ends of wires and for endless rope slings, each wire rope used in hoisting or lowering, or in pulling loads, must consist of one continuous piece without knot or splice.
- Wire rope may not be used, if in any length of eight diameters, the total number of visible broken wires exceeds 10 percent of the total number of wires, or if the rope shows other signs of excessive wear, corrosion, or defect.

### 9.10 Natural Rope and Synthetic Fiber

Natural or synthetic fiber ropes must be inspected for wear, mold, or damage before each use. They may only be used if the manufacturer's recommended load capacity exceeds the load by a factor of five times.

### 9.11 Overhead Power Lines

Where overhead electric conductors are encountered in proximity to a work area, the supervisor is responsible for:

- Ascertaining the voltage and minimum clearance distance required, as stated below,
- Maintaining the minimum clearance distance,
- Ensuring that the requirements of the Wisconsin State Code are complied with. Employees must be capable of calculating the safe and proper working distances.

**Low voltage lines.** When work is being carried out in proximity to energized electrical service conductors operating at 750 volts or less, such work shall be performed in a manner to prevent contact by any worker with the energized conductors.

**Overhead lines.** If work is to be performed near overhead lines, the lines shall be deenergized and grounded, or other protective measures shall be provided before work is started. If the lines are to be de-energized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to de-energize and ground them. If protective measures, such as guarding, isolating, or insulating, are to be used these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

**Unqualified persons.** When an unqualified person is working in an elevated position, or on the ground, near overhead lines, the location shall be such that the



## ABC Midwest Solutions 2022 Safety Program

person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:

- 10 ft. for voltages to ground 50kV or below;
- 10 ft. ABC Midwest Solutions, LLCs 0.4 inch for every 1kV over 50kV, for voltages to ground over 50kV.

For other instructions pertaining to operations near power lines see the Wisconsin State Code.

### 10.0 Jacks and Supports

All jacks, supports, stands and similar equipment should be marked with the manufacturers rated load limit. The rated load limit must never be exceeded. Hoisted or jacked equipment must be secure from movement before working on it. Equipment must be properly blocked and thoroughly supported before work may be performed under it. Check to insure everyone is clear before lowering equipment onto blocks or supports. Only approved chains, cables or slings may be used for lifting equipment.

Wooden blocks shall be placed between metal jack-stands and metal equipment to prevent slippage or movement.

- **10.1 Jack Types**

A jack is an appliance for lifting and lowering or moving horizontally a load by application of a pushing force. Jacks may be of the following types: Lever and ratchet, screw and hydraulic. The rating of a jack is the maximum working load it is designed to lift safely through a specified distance. The operator must make sure that the jack used has a rating sufficient to lift and sustain the load. The rated load must be legibly and permanently marked in a prominent location on the jack by casting, stamping, or other suitable means.

### 11.0 Compressed Air Use

Compressed air may not be used for cleaning purposes unless it is reduced to less than 30 p.s.i. (pounds per square inch) at the point of operation and then only with effective chip guarding and personal protective equipment.

- **11.1 Compressed Air Tools**

- In the use of compressed air tools, care should be used to prevent the tool from being shot from the gun.



### ABC Midwest Solutions 2022 Safety Program

- When momentarily out of use the gun should be laid in such position that the tool cannot fly out if the pressure is unexpectedly released. When not in use, all tools should be removed from the gun.
- In disconnecting a compressed air tool from the air line (portable air compressor), care should be exercised to first shut off the pressure and then to operate the tool to exhaust the pressure remaining in the hose. Tools using quick release couplings may be detached without shutting off the pressure.
- Compressed air hoses or guns must not be pointed at or brought into contact with the body of any person.

## 12.0 Pneumatic Powered Tools and Hose

- The operating trigger on portable hand-operated utilization equipment must be so located as to minimize the possibility of its unanticipated operation and must be arranged to close the air inlet valve automatically when the pressure of the operator's hand is removed.
- A tool retainer must be installed on each piece of utilization equipment that, without such a retainer, may eject the tool.
- Hose and hose connections used for conducting compressed air to utilization equipment must be designed for the pressure and service to which they are subjected
- Only the valve should be used to turn off air pressure. Never crimp the hose to shut off the pressure.

## 13.0 Structures and Overhead Work

Where overhead work is in progress protective measures must be initiated to prevent tools or other objects from falling on those below. Hard hats must be worn when working beneath other workers or equipment or when there is a possibility of injury from falling objects.

## 14.0 Trenching

Excavations or trenches four (4) feet in depth or greater must utilize proper shoring or sloping procedures as defined in the Wisconsin State Code. ABC MIDWEST SOLUTIONS, LLC employees will not conduct trenching deeper than four feet. This work, if necessary, will be contracted out. Before underground excavating begins, utility locations must be identified.



## 15.0 Forbidden Activities

- Removing, displacing, damaging, destroying or carrying off any safety device, safeguard, notice, or warning furnished for use on the campus.
- Interfering with the use of any method or process adopted for the protection of any ABC MIDWEST SOLUTIONS, LLC employee.
- Neglecting to do everything reasonably necessary to protect the life and safety of employees.



## 17. Vehicle and Golf Cart Safety

### 1.0 Introduction

All members of the university authorized to drive university vehicles or otherwise operate a vehicle to conduct university business must operate vehicles in strict accordance with all Wisconsin State and Dane County laws. No work or errand is of sufficient importance to violate safe driving practices. Safe vehicle operation is the responsibility of all members of the ABC MIDWEST SOLUTIONS, LLC community while participating in all ABC MIDWEST SOLUTIONS, LLC business or activities.

- **1.1 Hazards**

Traffic-related motor vehicle accidents are the leading cause of work-related injury or death. According to the National Institute of Occupational Safety and Health, three workers die every day in vehicle crashes.

Vehicle accidents can happen at any time. In general, most accidents transpire after events that are physically tiring, during long trips, during bad weather, or in the late afternoon and evening hours. The ABC MIDWEST SOLUTIONS, LLC community experiences the majority of accident due to misjudging clearance. This includes parking accidents (backing-up) and turning radius.

- **1.2 Regulation**

Wisconsin State Code Motor Vehicles rules and regulations govern safe vehicle use in Wisconsin State Code. Wisconsin State General Safety & Health Standards covers operation of motor vehicle trucks and trailers. Dane County Code further refines and regulates vehicle use and traffic within the county. The Department of Motor Vehicles can assist you in locating these documents upon request.

### 2.0 Vehicle and Golf Cart Safe Operator Program

The purpose of this program is to ensure that ABC MIDWEST SOLUTIONS, LLC drivers have the skills and information that is needed to be effective and safe vehicle operators; to communicate driver responsibilities; reduce vehicle accidents; and to implement corrective actions for poor driving or repetitive unsafe incidents.

- **2.1 Policy**

ABC MIDWEST SOLUTIONS, LLC strives to protect the safety of all community members by authorizing qualified drivers to operate university vehicles. Drivers shall be trained according to this program. ABC MIDWEST SOLUTIONS, LLC may



## ABC Midwest Solutions 2022 Safety Program

conduct checks of a driver's driving record. Employees who demonstrate irresponsible or unskilled driving behavior will be evaluated for corrective action.

### **2.2 ABC MIDWEST SOLUTIONS, LLC Driver Eligibility**

ABC MIDWEST SOLUTIONS, LLC drivers must have a valid state (United States) drivers license in their possession and ABC MIDWEST SOLUTIONS, LLC Driver Certification to drive or operate a ABC MIDWEST SOLUTIONS, LLC owned vehicle or golf cart.

Drivers of ABC MIDWEST SOLUTIONS, LLC owned vehicles must have a valid drivers license and have driven in the United States for a minimum of two years. Persons who are restricted from driving by order of a doctor must never drive or operate a university vehicle.

Those who wish to drive a vehicle rented through ABC MIDWEST SOLUTIONS, LLC (it must be used for university purposes) shall have a valid state drivers license in their possession, be certified by ABC MIDWEST SOLUTIONS, LLC through Campus Safety, and adhere to the safe driving practices and training requirements contained in this document. See section 2.7 for insurance requirements. Drivers certification is not required to rent a vehicle while traveling or renting a Zip Car.

Certification can be provided, at the discretion of the university to ABC MIDWEST SOLUTIONS, LLC students and ABC MIDWEST SOLUTIONS, LLC employees who drive for ABC MIDWEST SOLUTIONS, LLC programs, such as athletic events, AS ABC MIDWEST SOLUTIONS, LLC activities, class field trips, or forensic events.

Volunteers who are appointed to drive by a ABC MIDWEST SOLUTIONS, LLC program must obtain certification through ABC MIDWEST SOLUTIONS, LLC Campus Safety and provide written authorization by a program representative before driving a ABC MIDWEST SOLUTIONS, LLC owned or rented vehicle.

### **2.3 Responsibilities**

#### **Faculty, Administrator, Staff, Student, and Volunteer Drivers**

- Observe and practice safe vehicle operation.
- Attend training.
- Report vehicle damage or defects.
- Report all vehicle incidents, regardless of size or damage, to one's supervisor and to Campus Safety.

#### **Advisors, Coaches, Instructors, Trip Leaders**



### ABC Midwest Solutions 2022 Safety Program

- Attend the same training required of ABC MIDWEST SOLUTIONS, LLC drivers (this applies to any ABC MIDWEST SOLUTIONS, LLC representative that sponsors activities that require a driver or supervises employees who drive for ABC MIDWEST SOLUTIONS, LLC).
- Ensure that employees and students receive training and driver certification before operating a university vehicle.
- Report accidents to Campus Safety
- Orient drivers to the vehicle they are likely to use.

### **Directors, Managers, Supervisors**

- Responsible for instilling appropriate driving behaviors.
- Orient drivers to the vehicle they are likely to use.

### **Campus Safety Director /Risk Manager/ Environmental Health & Safety Manager**

- Monitor the application of this program and make adjustments accordingly
- Provide training opportunities for ABC MIDWEST SOLUTIONS, LLC drivers
- Enforce the directives of this program.
- Assist campus advisors, coaches, instructors, trip leaders, and other drivers in meeting the objectives of this program

### **2.4 Motor Vehicle Records**

ABC MIDWEST SOLUTIONS, LLC will check motor vehicle records of new candidates considered for jobs that require a valid drivers license. Campus Safety may conduct spot checks of driving records for existing employees and student drivers as they attend training.

If a past record or driving behavior indicates that a driver is a risk, then that driver will not be permitted to drive a university vehicle or any other vehicle used for approved ABC MIDWEST SOLUTIONS, LLC purposes.

### **2.5 Certification Training**

New ABC MIDWEST SOLUTIONS, LLC drivers shall complete a training program before being permitted to drive a university vehicle. Employees who complete





## ABC Midwest Solutions 2022 Safety Program

driver training will be issued a ABC MIDWEST SOLUTIONS, LLC driver's certification but must renew certification at expiration dates.

Training shall include:

- An overview of ABC MIDWEST SOLUTIONS, LLC vehicle use and driving policy
- Insurance procedures
- Safe driving procedures
- Campus specific driving procedures

ABC MIDWEST SOLUTIONS, LLC certified drivers must renew their certification every two years. It is the driver's responsibility to seek refresher training and certification. Supervisors, advisors, coaches, and instructors should orient drivers to the vehicles that the driver is most likely to use.

### **2.6 Driver Improvement Training**

Employees may be required to attend driver improvement class after any vehicle incident. However, drivers will be required to attend driver improvement class for any one of the following situations.

- Driver involved in two or more accidents regardless of fault or severity of damage or extent of injuries. For example, a person involved in two unclaimed fender benders with no injuries must attend a driver improvement class.
- A person is injured during an accident.
- Total damage to vehicle and/or property exceeds \$1000 per accident.

The department that the employee was driving for at the time of the incident may pay the class fee. There are some ABC MIDWEST SOLUTIONS, LLC departments that require the employee pay the class fee.

### **2.7 Insurance**

ABC MIDWEST SOLUTIONS, LLC insures each ABC MIDWEST SOLUTIONS, LLC-owned vehicle separately. Insurance coverage follows the vehicle; not the driver. If you are driving your own vehicle, your insurance is primary. If you are driving a ABC MIDWEST SOLUTIONS, LLC vehicle, the university's insurance is primary. If you rent a vehicle for ABC MIDWEST SOLUTIONS, LLC business independent of the Campus Safety office, make sure you follow the insurance coverage instructions provided in



## ABC Midwest Solutions 2022 Safety Program

Appendix A. Sponsoring departments are responsible for paying deductibles after an accident.

Drivers who operate an assigned vehicle should make sure that the insurance packet is in the glove box of their vehicle. The ABC MIDWEST SOLUTIONS, LLC Mechanic will check all ABC MIDWEST SOLUTIONS, LLC vehicles when they are fueled and serviced to verify that the accident reporting/insurance information is located within the vehicles. Please see Appendix A. Traveling on ABC MIDWEST SOLUTIONS, LLC Business and What to do in the Event of a Vehicle Accident (or Crisis) While on ABC MIDWEST SOLUTIONS, LLC Business.

### **2.8 Enforcement**

Campus Safety shall have authority to stop all drivers on the ABC MIDWEST SOLUTIONS, LLC campus when observed driving unsafely or otherwise in violation of this program. Members of the ABC MIDWEST SOLUTIONS, LLC community are encouraged to report erratic, irresponsible, or unsafe incidents or accidents to Campus Safety.

## **3.0 Vehicle Condition**

Any person assigned to drive a university vehicle or golf cart is responsible for all matters pertaining to the safe operation of the vehicle. Motor vehicles, including golf carts, shall not be modified in any manner that affects the recommended mode of operation, speed or safety of the vehicle.

- **3.1 Inspection**

The driver is encouraged to conduct an inspection of the vehicle before operation. The ABC MIDWEST SOLUTIONS, LLC maintenance mechanic may be called upon to teach drivers how to inspect their vehicles.

Use the inspection form in Appendix B to guide the inspection and log any deficiencies or defects found. Defects or needed repairs must be reported promptly to your supervisor and to Facilities Management. The vehicle shall be removed from service for any problem that warrants the vehicle unsafe to drive until repairs are made.

### **3.2 Cleanliness**

It is the driver's responsibility to keep the vehicle interior clean and free of loose tools and other debris. The windshield must be kept clean for good visibility.

### **3.3 Maintenance**



## ABC Midwest Solutions 2022 Safety Program

ABC MIDWEST SOLUTIONS, LLC drivers who have been assigned a specific vehicle and are the primary user of that vehicle are responsible for minor maintenance activities. Any vehicle maintenance beyond that stated here is the responsibility of Facilities Management. It is the driver's responsibility to submit a work request to Facilities Management when service is required.

Drivers are responsible for fueling the vehicle in a safe manner.

- Do not smoke or conduct fueling operations near a source of ignition.
- Do not spill fuel.
- Do not inhale fuel fumes.

### 3.4 Vehicle Loads and Loading

Loads must be properly distributed and not piled too high. Loading must be such that the driver has clear vision to the front, sides and rear. When necessary, loads must be blocked, tied, flagged or padded to prevent shifting or damage.

All loads transported on trucks and/or truck trailers must be properly secured and distributed, and limited to a safe operating load for driving conditions.

When it is necessary to unload from the street side of the vehicle, extra care and precaution should be used. Whenever possible, work should be done from the curbside.

### 4.0 Vehicle Operation

University vehicles represent ABC Midwest Solutions, LLC and should be driven in a manner so as to create a favorable impression on the public. Show more than ordinary courtesy and consideration for other drivers and pedestrians.

Secure all doors, end gate enclosures, and equipment before driving. Drivers or passengers must not throw objects from the vehicle. All materials being transported must also be secured to prevent material from being blown off the vehicle.

If one must eat or perform other potentially distracting functions, please find a place to safely stop in order to do so. Consistent with ABC MIDWEST SOLUTIONS, LLC's tobacco free policy for buildings and grounds, the use of tobacco products is not permitted in ABC MIDWEST SOLUTIONS, LLC vehicles. Wisconsin State Code prohibit wearing radio headphones while operating a vehicle. Cell phones are prohibited while driving.

It is the driver's responsibility to open and shut campus gates in order to prevent unauthorized vehicles from entering the campus.



## ABC Midwest Solutions 2022 Safety Program

Do not drive on areas not intended for vehicle traffic. In rare cases it may be necessary to drive or park on areas not intended for vehicle traffic. Use special care while taking into account the weight of the vehicle and damage that might result. Extra courtesy must also be used in these instances.

ABC MIDWEST SOLUTIONS, LLC Vehicles shall not be used for personal or non-ABC MIDWEST SOLUTIONS, LLC related purposes.

- **4.1 Speed**

Drivers must operate equipment at a safe speed for roadway conditions.

The on-campus speed limit is 5 miles per hour. A good “rule of thumb” is to drive at a fast walking pace. On campus drivers of vehicles and golf carts shall stop at blind intersections and then proceed slowly while looking for pedestrians or other vehicles.

Off campus drivers of vehicles must also comply with the following Vehicle Code requirements governing speed regulations:

Basic Speed Law requires a speed that is safe for all conditions including traffic, surface and width of roadway, weather conditions, and visibility.

Observe Speed Limits established by Code for certain situations such as blind crossings, business and residential districts, and other special zones established by the posting of speed limit signs, as well as Special Speed Restrictions as established to cover various types of vehicles, trailers or combinations.

- **4.2 Pedestrians**

The campus is a pedestrian – not a vehicle – zone. Campus pedestrians do not expect vehicles to be on site. They are, therefore, less aware of the presence and danger of vehicles. Always give the pedestrian the right of way. Do not sound the horn to warn a pedestrian unless it is necessary to prevent an accident or injury. While the campus vehicle speed limit is 5 mph, drivers are expected to slow to a walking speed when in crowded pedestrian areas.

Vehicles must remain on paved paths and absolutely avoid taking short cuts through grass, gravel, and other inappropriate driving areas.

- **4.3 Right of Way**

Drivers must drive courteously at all times and should yield the right-of-way to other vehicles or pedestrians as outlined in RCW 46.61.180-220.



#### 4.4 Backing the Vehicle

Accidents are more likely to occur when backing a vehicle. Whenever possible, drivers should drive and park the vehicle so as not to require backing up.

Recognizing that this will not always be possible, the driver should station a spotter at a point giving a clear view of the rear of the vehicle and the driver when backing a vehicle where vision is obstructed.

If the driver is alone, the driver shall get out of the vehicle to check the clearance and then resume backing the vehicle slowly out of the area. The driver should get out of the vehicle to check the clearance as many times as necessary to back up safely.

#### 4.5 Parking

Drivers must comply with State and County parking regulations and ABC MIDWEST SOLUTIONS, LLC parking designations except when exemption is granted for work involving construction, operations, entrance or egress.

At any time a university vehicle is parked, it is the driver's responsibility to make certain that the:

- Wheels are turned into the curb when parked on an incline.
- Vehicle is taken out of gear and put in park position in those vehicles having automatic transmission. Whenever possible, vehicles with standard transmission will be left in gear.
- Parking brake is set.

Drivers shall not park vehicles:

- In fire lanes
- On soft surfaces.
- In front of building entrances, stairways, ramps, or main thoroughfares or other no parking zones.

#### 5.0 Golf Cart Operation

Golf cart operators must follow the general vehicle driver requirements of this program. In addition:



## ABC Midwest Solutions 2022 Safety Program

- Golf carts should be operated on campus grounds only. Carts can cross perpendicular to County roads. Carts should not be driven on public roads.
- Golf carts that will be used between dusk and dawn shall be equipped with headlights.
- Golf cart drivers shall be responsible for the security of the ignition keys for the period that the cart is assigned to them.
- Golf carts shall not be modified in any manner that affects the recommended mode of operation, speed, or safety of the vehicle.
- Golf carts shall be parked on hard surfaces.
- ABC MIDWEST SOLUTIONS, LLC driving certification is required to qualify as a golf cart driver.

## 6.0 Vehicle Safety Equipment

- **6.1 Seats & Seat Belts**

When driving or riding in a university vehicle or other vehicle used to conduct ABC MIDWEST SOLUTIONS, LLC business, one must sit in a seat designed for this purpose and seat belts must be worn in accordance with state regulations. Seatbelts are not standard equipment on golf carts and are, therefore, not required.

Persons may not ride in the back of trucks, golf carts, vans, trailers or in other parts of a vehicle that do not have seats. If there are not enough passenger seats for all passengers, then some people must walk or the driver can make more trips to transport all of the passengers.

The seat belt must be adjusted so that it is snug enough to afford the maximum protection without being uncomfortable. Fasten the seat belt before moving the vehicle. Do not attempt to fasten the seat belt while the vehicle is moving.

When maneuvering a vehicle into a position that requires backing into a location at a job site or dock area, the seat belt may be unfastened temporarily while such maneuvering is in progress.

### 6.2 Headlights

Please use headlights on vehicles that are equipped with lights whenever driving on campus.

## 7.0 Student Use of ABC MIDWEST SOLUTIONS, LLC Vehicles



## ABC Midwest Solutions 2022 Safety Program

Students who wish to drive ABC MIDWEST SOLUTIONS, LLC vehicles may do so for activities or events related to student club, athletic, or study programs, but must be certified. See section 2.

If an individual uses his or her privately owned vehicle to transport others for activities related to ABC MIDWEST SOLUTIONS, LLC business, the vehicle owner is responsible for providing insurance coverage. See section 2 and Appendix A.

- **7.1 Driving a ABC MIDWEST SOLUTIONS, LLC Vehicle**

When reserving a vehicle through Campus Safety for trips in duration of 24 hours or more the driver should complete and return form Appendix C to the sponsoring department's office. The advisor or instructor sponsoring the trip should endorse and date the form authorizing use.

### **7.2 Itineraries & Contacts**

An itinerary shall be created before the trip and include the route, arrival and departure dates and times, planned rest stops, boarding accommodation phone numbers, and destination points.

Travelers shall provide to the sponsoring office a contact list of all travelers and emergency contact names and numbers for each traveler. The sponsoring office should provide to travelers the designated ABC MIDWEST SOLUTIONS, LLC contact's home, work, and cell phone number.

### **7.3 Driving Conditions & Times**

Advisors, coaches, instructors, and or trip leaders are responsible for assessing the conditions for safe driving. It shall be the responsibility of the driver and the advisor, coach, instructor, or trip leader to cancel the trip, if the conditions indicate that it is unsafe to proceed. The following are some of the factors that should be evaluated prior to travel.

- Physical fitness of the driver. Is the driver sick, tired, or injured?
- Weather conditions. Is it icy, snowy, or foggy with poor visibility?
- Driver skill. Is this a young or new driver or a driver that has seldom driven a large vehicle?

It is the driver's responsibility to be fully rested and alert before driving. The driver should ask the passenger who is riding in the front seat position to watch the driver for signs of decreased driver ability, such as nodding off during the trip. The passenger must also be fully rested and alert.



## ABC Midwest Solutions 2022 Safety Program

It is recommended that the driver stop every 90 minutes of travel for a rest period and exchange with a different certified driver for the next 90 minutes.

Driving is prohibited between 12:00 a.m. and 5:30 a.m. for all drivers less than 25 years of age. A ABC MIDWEST SOLUTIONS, LLC certified driver who is 25 years of age or older, and is well-rested and alert may drive during these restricted hours provided the driver complies with the other conditions of this program. Early departures are authorized within the prohibited period providing they are departing from the ABC MIDWEST SOLUTIONS, LLC campus. The team or group is required to stay overnight when they cannot comply with these conditions.

### 7.4 Communication

All student groups who use a ABC MIDWEST SOLUTIONS, LLC vehicle must have among them at least one cell phone or other two-way communication device for emergency purposes. It is up to the individuals in the group or department to provide this communication.

## 8.0 Vendors and Contractors

The contracting ABC MIDWEST SOLUTIONS, LLC Department should provide a map to each contracted vendor that illustrates appropriate campus routes for vendors to use. Campus Safety may pre-authorize certain departments, such as Construction Management, Dining Services, and Facilities Management, to issue vendor or contractor passes. Vendors and Contractors shall observe approved vehicle routes and avoid heavy pedestrian zones. The vendor may request permission from Campus Safety to deviate from the approved vehicle routes.

## 9.0 Moving Violation or Parking Tickets

The driver is responsible, including payment of fines, for all moving violations and parking tickets. Unpaid parking tickets (including Sno-pass and other permit violations) issued to the university will be traced back to the department and charged to the department. The department is encouraged to seek reimbursement from the driver.

## 10.0 Accidents

Immediately call local authorities to report an accident that occurs off campus. Follow that by notifying Campus Safety. Follow the instructions in the insurance packet located in the vehicle glove box.

On campus accidents, regardless of severity, must also be immediately reported to Campus Safety and to your supervisor or advisor.

- 10.1 Medical Care





## ABC Midwest Solutions 2022 Safety Program

It is the trip leader's responsibility to determine whether individuals involved in a vehicle crash must be evaluated at a medical facility. This shall be determined based on the severity of the accident, consultation with emergency response personnel, and potential for injury.

### 10.2 Driving Privileges

Drivers who are involved in an accident shall discontinue driving a ABC MIDWEST SOLUTIONS, LLC vehicle or their own vehicle when conducting ABC MIDWEST SOLUTIONS, LLC activities, until an investigation of the accident is complete. The Risk Manager will notify the driver and driver's supervisor or advisor when driving privileges are restored. Driver improvement training may be required for drivers involved in a vehicle accident. See section 2.6.

Drivers who are off-campus at the time of an accident must follow accident reporting procedures in Appendix A. Upon return to campus, the driver must provide the police report and statements to ABC MIDWEST SOLUTIONS, LLC Safety and the Risk Manager (Finance and Operations Office).

Student drivers meeting any of the criteria described in 2.6 will not be permitted to resume driving privileges.



## 18. Welding and Cutting

### 1.0 Gas Welding and Cutting

- **1.1 Handling Compressed Gas Cylinders**

Follow these procedures when handling gas cylinders:

- Valve protection caps must be in place and secured.
- Cylinders will be moved by tilting and rolling them on their bottom edges. They must not be intentionally dropped, struck, or permitted to strike each other violently.
- Cylinders must be either firmly secured on a special carrier intended for this purpose or regulators must be removed and valve protection caps put in place before cylinders are moved.
- A suitable cylinder truck, chain, or other steadying device must be used to keep cylinders from being knocked over while in use or in storage.
- Oxygen cylinders must be stored separated from fuel gas cylinders or combustible materials by a minimum distance of 20 feet or by a five-foot high non-combustible barrier with a fire resistive rating of one-half hour. Cylinders must not be stored near elevators, stairs or gangways. Assigned storage must prevent cylinders from being knocked over or damaged.

#### 1.2 Placing Cylinders

Cylinders must be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them. When this is impractical, fire resistant shields must be used.

Cylinders must be placed where they cannot become part of an electrical circuit. Electrodes must not be struck against a cylinder to strike an arc.

Fuel gas cylinders must be placed with valve end up whenever they are in use. They must not be placed in a location where they would be subject to open flame, hot metal, or other sources of artificial heat.

#### 1.3 Use of Fuel Gas



## ABC Midwest Solutions 2022 Safety Program

Employees should understand and follow these safety procedures developed by the State of Wisconsin and specified in Wisconsin State Code:

Before a regulator to a cylinder valve is connected, the valve must be opened slightly and closed immediately. (This action is generally termed “cracking” and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve must stand to one side of the outlet not in front of it. The valve of a fuel gas cylinder must not be cracked where the gas would reach welding work, sparks, flame, or other possible sources of ignition

The cylinder valve must always be opened slowly to prevent damage to the regulator. For quick closing, valves on fuel gas cylinders must not be opened more than 1 ½ turns.

When a special wrench is required, it must be left in position on the stem of the valve while the cylinder is in use so that the fuel gas flow can be shut off quickly in case of an emergency. Nothing must be placed on top of a fuel gas cylinder, when in use, which may damage the safety device or interfere with the quick closing of the valve.

Fuel gas must not be used without reducing the pressure through a regulator attached to the cylinder valve.

Before a regulator is removed from a cylinder valve, the cylinder valve must always be closed and the gas released from the regulator.

If, when the valve on a fuel gas cylinder is opened, there is found to be a leak around the valve stem, the valve must be closed and the gland nut tightened. If this action does not stop the leak, the use of the cylinder must be discontinued, and it must be properly tagged and removed from the work area.

In the event that fuel gas is leaking from the cylinder valve, rather than from the valve stem, and the gas cannot be shut off, the cylinder must be properly tagged and removed from the work area. If a regulator attached to a cylinder valve will effectively stop a leak through the valve seat, the cylinder need not be removed from the work area.

If a leak develops at a fuse ABC Midwest Solutions, LLC or other safety device, the cylinder must be removed from the hot work area.

Cylinders not having fixed hand wheels must have keys, handles, or non-adjustable wrenches on valve stems while in service.

Torches must be inspected before use for leaking shutoff valves, hose couplings, and tip connections. Defective torches may not be used.



## ABC Midwest Solutions 2022 Safety Program

Torches must be lit by friction lighters or other approved devices, and not by matches or from hot work.

### 1.4 Regulators and Gauges

Oxygen and fuel gas pressure regulators, including their related gauges, must be in proper working order while in use.

### 1.5 Oil and Grease Hazards

Oxygen cylinders and fittings must be kept away from oil or grease. Cylinders, cylinder caps and valves, couplings, regulators, hose, and apparatus must be kept free from oil or greasy substances and must not be handled with oily hands or gloves. Oxygen must never be directed at oily surfaces, greasy clothes, or within a fuel oil or other storage tank or vessel.

### 1.6 Hoses

Fuel gas hose and oxygen hose must be easily distinguishable from each other. The contrast may be made by different colors or by surface characteristics readily distinguishable by the sense of touch. Oxygen and fuel gas hoses must not be interchangeable. A single hose having more than one gas passage must not be used.

When parallel sections of oxygen and fuel gas hose are taped together, not more than 4 inches out of 12 inches may be covered by tape.

All hoses carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance that may ignite or enter into combustion, or be in any way harmful to employees, must be inspected at the beginning of each working shift. Defective hoses must be removed from service.

Hoses which have been subject to flashback, or which show evidence of severe wear or damage, must be tested to twice the normal pressure to which it is subject, but in no case less than 300 p.s.i. Defective hose, or hose in doubtful condition, must not be used.

Hose couplings must be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion.

Boxes used for the storage of gas hoses must be ventilated. Hoses, cables, and other equipment must be kept clear of passageways, ladders and stairs.

### 1.7 Torches



## ABC Midwest Solutions 2022 Safety Program

The operator must clean clogged torch tip openings with suitable cleaning wires, drills, or other devices designed for such purpose.

Torches must be inspected by the operator at the beginning of each working shift for leaking shutoff valves, hose couplings, and tip connections. Do not use defective torches.

Light torches with friction lighters or other approved devices, and not by matches or from hot work.

## 2.0 Arc Welding and Cutting

### • 2.1 Manual Electrode Holders

Only manual electrode holders which are specifically designed for arc welding and cutting, and are of a capacity capable of safely handling the maximum rated current required by the electrodes, may be used.

Any current-carrying parts passing through the portion of the holder that the operator grips in his hand, and the outer surfaces of the jaws of the holder, must be fully insulated against the maximum voltage encountered to ground.

### 2.2 Welding Cables and Connectors

Cables in need of repair may not be used. When a cable, other than the cable lead becomes worn to the extent of exposing bare conductors, the portion thus exposed must be protected by means of rubber and friction tape or other equivalent insulation.

### 2.3 Operating Instructions

Employees must follow these safe means of arc welding and cutting:

- When electrode holders are to be left unattended, the electrodes must be removed and the holders placed or protected so that they cannot make electrical contact with employees or conducting objects.
- Hot electrode holders may not be dipped in water; to do so may expose the arc welder or cutter to electric shock.
- The power supply switch to the equipment must be turned off whenever the welder has to leave his work or stop for any appreciable length of time, or whenever the arc welding or cutting equipment needs to be moved.



## ABC Midwest Solutions 2022 Safety Program

- Any faulty or defective equipment must be reported to the shop maintenance manager, instructor, or equipment technician.

### 2.4 Shielding

Whenever practical, all arc welding and cutting operations must be shielded by non combustible or flameproof screens, which will protect employees and other persons working in the vicinity from the direct rays of the arc.

## 3.0 Protective Clothing

- **3.1 General Requirements** Employees exposed to the hazards created by welding, cutting, or brazing operations will use proper personal protective equipment. Appropriate protective clothing required for any welding operation will vary with the size, nature and location of the work to be performed. ABC MIDWEST SOLUTIONS, LLC will provide equipment for employees. The following protective clothing may be employed based on the job hazard assessment:
  - Except when engaged in light work, all welders should wear flameproof gauntlet gloves.
  - Flameproof aprons made of leather, or other suitable material may also be desirable as protection against radiated heat and sparks.
  - Woolen clothing is preferable to cotton because it is not so readily ignited and helps protect the welder from changes in temperature. Cotton clothing, if used, should be chemically treated to reduce its combustibility. All outer clothing such as jumpers or overalls must be reasonably free from oil or grease.
  - Sparks may lodge in rolled-up sleeves or pockets of clothing, or cuffs of overalls or trousers. It is therefore recommended that sleeves and collars be kept buttoned and pockets be eliminated from the front of overalls and aprons. Trousers or overalls should not be turned up on the outside. \*Note: For heavy work, fire-resistant leggings, high boots, or other equivalent fire resistant clothing should be used.
  - Jackets or shoulder covers made of leather or other suitable materials must be worn during overhead welding or cutting operations. Leather skull caps should be worn under helmets to prevent head burns.

### 3.2 Eye and Face Protective Wear (See Appendix A)

Eye protection sufficient to protect the worker from harmful radiation must be used. Employees in the area not protected from the arc by screening must be



## ABC Midwest Solutions 2022 Safety Program

protected by filter lenses meeting the standard requirements. When two or more welders are exposed to each other's arc, filter lens goggles must be worn under welding helmets. Hand shields to protect the welder against flashes and radiant energy should be used when either the helmet is lifted or the shield is removed.

Employees whose vision requires the use of corrective lenses must be protected by goggles or eyeglasses of one of the following types:

- Eyeglasses whose protective lenses provide optical correction;
- Goggles that can be worn over corrective lenses without disturbing the adjustment of the glasses.
- Goggles that incorporate corrective lenses mounted behind the protective lenses.

Face and eye protection equipment must be kept clean and in good repair. The use of this type equipment with structural or optical defects is prohibited.

The table in the appendix at the end of this chapter should be used as a guide in the selection of face and eye protection for the hazards and operations noted.

### 4.0 Fire Prevention

When practical, objects to be welded, cut, or heated must be moved to a designated safe location or, if the objects to be welded, cut, or heated cannot be readily moved, all movable fire hazards in the vicinity must be taken to a safe place, or otherwise protected.

If the object to be welded, cut, or heated cannot be moved and if all the fire hazards cannot be removed, combustibles must be shielded using flameproof covers, shielded with metal, guards, curtains, or wet down to help prevent ignition of material.

No welding, cutting, or heating is permitted where the application of flammable paints, or the presence of other flammable compounds, or heavy dust concentrations creates a hazard.

Fire extinguishing equipment must be immediately available in the work area and must be maintained in a state of readiness for instant use.

When the welding, cutting, or heating operation is such that normal fire prevention precautions are not sufficient, additional personnel must be assigned to guard against fire while the actual welding, cutting, or heating operation is being performed, and for a sufficient period of time after completion of the work to ensure that no possibility of fire



## ABC Midwest Solutions 2022 Safety Program

exists. Such personnel will be instructed by the supervisor or delegate as to the specific anticipated fire hazards and how the firefighting equipment provided is to be used.

When welding, cutting, or heating is performed on equipment bodies, cowlings or casings, since direct penetration of sparks or heat transfer may introduce a fire hazard to an adjacent area, the same precautions must be taken on the opposite side as are taken on the side on which the welding is being performed.

All drums, pails, and other containers, which contain or have contained flammable liquids, must be kept closed (except when removing or transferring the contents). Empty containers are to be removed to a safe area apart from hot work operations or open flames.

Before welding, cutting, or heating is begun, all drums, containers, or hollow structures that have contained toxic or flammable substances must either be filled with water or thoroughly cleaned of such substances and ventilated and tested. When welding, cutting and heating on steel pipelines containing natural gas, the pertinent portions of regulations issued by the Department of Transportation, Office of Pipeline Safety, and Minimum Federal Safety Standards for Gas Pipelines, must be followed.

Before heat is applied, a vent opening must be provided for the release of any built-up pressure caused by the applying of heat to any drum, container, or hollow structure.

### 5.0 Designated Welding Areas

There are two designated welding areas on campus:

- The welding studio in Ingram
- The welding area in the ABC MIDWEST SOLUTIONS, LLC mechanic's shop.

These areas shall meet the following criteria:

- Floors swept and clean of combustibles within 35 feet of work area.
- Flammable and combustible liquids and material will be kept 35 feet from work area.
- Provide adequate ventilation
- At least one 10-lb. dry chemical fire extinguisher should be within 35 feet of the work area.
- Protective dividers such as welding curtains or non-combustible walls will be provided to contain sparks and slag to the combustible free area.





## 6.0 Hot Work Permits (See Appendix B)

A hot work permit will be issued for all welding/cutting performed outside of designated welding areas. The Maintenance Supervisor or Environmental Health & Safety Manager is responsible for evaluating and issuing hot work permits for all ABC MIDWEST SOLUTIONS, LLC operations.

## 7.0 Ventilation and Protection in Welding, Cutting, and Heating

General welding, cutting, and heating not involving toxic conditions or materials described in the following sections, may normally be done without mechanical ventilation or respiratory protective equipment. Mechanical ventilation or respiratory protective equipment must be used when physical or atmospheric conditions create an unsafe accumulation of contaminants.

- **7.1 Mechanical Ventilation**

For purposes of this section, mechanical ventilation must meet the following requirements:

- Mechanical ventilation consists of either general mechanical ventilation systems or local exhaust systems.
- General mechanical ventilation must be of sufficient capacity and so arranged as to produce the number of air changes necessary to maintain welding fumes and smoke within safe limits.
- Local exhaust ventilation must consist of freely movable hoods intended to be placed by the welder or burner as close as to the work. The hood must be of sufficient capacity and so arranged as to remove fumes and smoke at the source and keep the concentration of them in the breathing zone within safe limits. If you are uncertain whether your hood meets these criteria, please contact the Environmental Health & Safety Manager for assistance.
- Contaminated air exhausted from a working space must be discharged into the open air or otherwise clear of the source of intake air.
- Oxygen must never be used for ventilation purposes, comfort cooling, blowing dust from clothing, or for cleaning the work area.



## 7.2 Welding, Cutting, or Heating Toxic Metals

Welding, cutting, or heating in any enclosed spaces involving the metals specified below must be performed with either general mechanical or local exhaust ventilation:

- Zinc-bearing base or filler metals or metals coated with zinc-bearing materials.
- Lead base metals.
- Cadmium-bearing filler materials.
- Chromium-bearing metals or metals coated with chromium-bearing materials.
- Metals containing lead, other than as an impurity, or metals coated with lead-bearing materials.
- Cadmium-bearing or cadmium-coated base metals.
- Metals coated with mercury-bearing metals.
- Beryllium-containing base or filler metals. Because of its high toxicity, work involving beryllium must be done with both local exhaust ventilation and air line respirators.

Wearing approved filter-type respirators will protect employees performing such operations without adequate ventilation. Approved air line respirators will protect employees performing such operations on beryllium-containing base or filler metals. Employees who use respirators must follow the policies and procedures in the Respiratory Protection Section.

## 7.3 Other Employees

Other employees exposed to the same atmosphere as the welders or burners must be protected in the same manner as the welder or burner.

## 8.0 Welding or Cutting Containers

### • 8.1 Used Containers

No welding, cutting, or other hot work may be performed on used drums, barrels, tanks or other containers until they have been cleaned so thoroughly as to make absolutely certain that there are no flammable materials present or any substances such as greases, tars, acids, or other materials that when subjected to heat, might



## ABC Midwest Solutions 2022 Safety Program

produce flammable or toxic vapors. Any pipelines or connections to the drum or vessel must be disconnected or blanked.

### **8.2 Venting and purging.**

All hollow spaces, cavities or containers must be vented to permit the escape of air or gases before preheating, cutting or welding. Purging with inert gas is recommended.

## **9.0 Cleaning Compounds**

Because of the possible toxicity or flammability of cleaning materials, employees are expected to take appropriate precautions, such as following manufacturer's instructions.

Degreasing or other cleaning operations involving chlorinated hydrocarbons will be so located that no vapors from these operations will reach or be drawn into the atmosphere surrounding any welding operation. In addition, trichloroethylene and perchloroethylene should be kept out of atmospheres penetrated by the ultraviolet radiation of gas-shielded welding operations.

## **10.0 Definitions**

**Welding / Hot Works Procedures:** Any activity that results in sparks, fire, molten slag, or hot material, that has the potential to cause fires or explosions.

**Hot Works:** Cutting, Brazing, Soldering, Thawing Pipes, Torch Applied Roofing, Grinding and Welding.

**Special Hazard Occupancies:** Any area containing Flammable Liquids, Dust Accumulation, Gases, Plastics, Rubber and Paper Products.

## **19. ABC MIDWEST SOLUTIONS, LLC Hazardous Waste Management Plan**

The purpose of the Hazardous Waste Management program at ABC Midwest Solutions, LLC (ABC MIDWEST SOLUTIONS, LLC) is to ensure the proper management of hazardous chemical wastes generated within the university. Regulations on handling and disposing of hazardous waste are comprehensive and complex on the federal, state, and local level. To comply with these regulations, all generators of hazardous wastes at ABC MIDWEST SOLUTIONS, LLC must follow the procedures in this program.



## ABC Midwest Solutions 2022 Safety Program

Environmental Health & Safety has the primary responsibility for conducting the hazardous waste management program. However, everyone at ABC MIDWEST SOLUTIONS, LLC who generates or handles hazardous waste is ultimately responsible for compliance with regulations and the success of the program.

A good resource for waste disposal guidance is the Department of Ecology website (<http://www.ecy.wa.gov/programs/hwtr/>). See the Step-by-Step Fact Sheets for Hazardous Waste Generators.

### Objectives

ABC Midwest Solutions, LLC is committed to handling its hazardous wastes responsibly by adhering to these objectives.

- 1. Reduce the quantity of hazardous waste generated to the lowest practical level.
  2. Manage hazardous wastes in a manner that protects the health and safety of students, staff, and faculty at ABC MIDWEST SOLUTIONS, LLC as well as the surrounding community.
  3. Manage hazardous wastes using the most responsible and environmentally sound methods practical. This includes reducing the potential for releases of hazardous waste into the environment and providing quick response to hazardous waste spills to minimize risk to people and the environment.
  4. Comply with all federal, state, and local regulations regarding hazardous waste management.

### Hazardous Chemical Waste Determination

The proper management of chemical wastes begins by determining first which wastes are hazardous. "Hazardous Waste" or "Dangerous Waste" is a term defined by regulatory agencies. State and federal regulations define categories that determine whether chemical wastes are considered hazardous, and if they are regulated.

Wisconsin State waste determinations are defined in the statutes. These regulations also define the Quantity Exclusion Limits (QEL), which determine the amount of hazardous wastes that may be accumulated and the frequency of disposal required. It is the intent of this management program to follow these regulations as they apply to all hazardous wastes at ABC Midwest Solutions, LLC.

### Empty Containers



## ABC Midwest Solutions 2022 Safety Program

Containers that have held hazardous materials are not classified as hazardous wastes when they are empty. A container is legally empty if the residue is less than one inch deep or less than one percent of the total capacity of the container. However, containers of acutely hazardous materials (QEL of 2.2 lb.) must be triple rinsed with an appropriate solvent. Any rinse solution must be disposed as a hazardous waste. The empty container may then be discarded or recycled after the label is removed or obliterated.

### **Priority Waste Management**

Effective chemical waste management uses priorities to minimize environmental impact of hazardous waste while meeting federal and state requirements. Priority waste management at ABC MIDWEST SOLUTIONS, LLC attempts first to minimize the volume of hazardous waste generated and then to manage the minimized volume of waste in the most responsible and environmentally sound manner possible.

#### *Priority 1: Waste Minimization*

The highest priority is to minimize the volume of waste generated using the following methods:

1. **Substitution** Often a non-hazardous chemical can be used in place of a hazardous chemical. Similarly, different procedures may be available that do not require use of hazardous chemicals. One should look for methods and materials that decrease the hazardous characteristics or quantity of the waste that we do generate, whenever possible.
2. **Scale Reduction** Microscale experimentation can be an effective procedure for hazardous waste reduction in research and teaching labs. Reducing the scale of experiments and procedures will reduce the quantity of hazardous waste produced.
3. **Inventory Control** A substantial portion of hazardous waste generated at ABC MIDWEST SOLUTIONS, LLC consists of unused, outdated chemicals and materials. Careful planning of quantities required can reduce disposal costs of excess chemicals and reduce costs due to over-purchasing. In many cases, costs to dispose of chemical wastes are greater than the purchase price of the original material. Departments are discouraged from purchasing new material that is already in inventory somewhere on campus and can be shared. Purchasing the smallest volume container that will last no longer than one year is strongly encouraged.
4. **Exchanges** Chemical purchases can also be reduced by borrowing and trading chemicals between laboratories, and by returning unused portions to the central stockroom for use by others. Other materials, such as



## ABC Midwest Solutions 2022 Safety Program

paints, may be useful to other departments on campus or may be donated to community agencies or individuals. You may offer product that you would otherwise dispose through a formal exchange, such as the Industrial Materials Exchange (IMEX) at <http://www.govlink.org/hazwaste/business/imex/>.

### *Priority 2: Waste Recovery*

Certain kinds of wastes can be recovered by commercial waste processing companies for repurification or use in commercial products. Waste recovery or recycling should be used whenever possible. Certain solvents, motor oil, photographic fixer, and metallic mercury will be collected and consolidated for commercial recovery and/or recycling.

### *Priority 3: Treatment-by-Generator*

A variety of chemicals can be treated in the laboratory process to reduce or eliminate the hazardous properties. These processes must follow the Wisconsin State guidelines. In-lab waste reduction methods will be used only if Priority 1 and 2 methods are not feasible.

1. Acid-Base Neutralization
2. Filtration
3. Separation
4. Evaporation
5. Carbon Absorption
6. Solidification

These wastes must be treated in suitable containers. Aqueous residuals must have a pH greater than 5.5 and less than 11 prior to discharge to the POTW sewer system. The precipitated solids must be managed and disposed appropriately. These methods are generally intended for small volumes of dilute wastes rather than for large quantities of unused materials. These may be especially effective when used in teaching labs as part of student and laboratory worker responsibilities.

Employees who choose to treat hazardous wastes must still mark the container with an accumulation start date. The container must be emptied every 180 days and any residue of the treatment process must be disposed within this same 180-day period.

Employees who treat hazardous wastes must maintain a written log (Appendix A) of treatment activities, including:



## ABC Midwest Solutions 2022 Safety Program

1. Quantity in pounds
2. Treatment method
3. Date of treatment

The log must be submitted to the Environmental Health & Safety Office at the end of the calendar year for inclusion in our annual Hazardous Waste Report to the state.

### *Priority 4: Commercial Disposal*

Hazardous materials that cannot be managed by any of the previous methods will be collected for packaging and transport by a commercial waste processing company for final disposal. The Environmental Health & Safety Office will arrange for packing and shipping.

### **Procedures for Hazardous Chemical Waste Disposal**

All personnel handling hazardous chemicals on the ABC MIDWEST SOLUTIONS, LLC campus must be familiar with ABC MIDWEST SOLUTIONS, LLC's Hazard Communication Program. This program explains the rights and responsibilities associated with working with hazardous materials. Please contact the Environmental Health & Safety office for training or information on Hazard Communication.

Personnel working in non-production laboratory facilities on campus must be aware of the OSHA Laboratory Standard (29CFR 1910.1450). They must be trained according to ABC MIDWEST SOLUTIONS, LLC's Chemical Hygiene Plan to ensure awareness of the hazards of chemicals present in their workplace. Please contact the Environmental Health & Safety office for training or information on Hazard Communication.

The Department of Ecology Step-by-Step Guide to Better Laboratory Management Practices #97-431 (<http://www.ecy.wa.gov/pubs/97431.pdf>) is another very good resource. It includes information on managing laboratory wastes, minimizing wastes, and storing chemicals compatibly.

#### *1. Accumulation Areas*

Hazardous chemical wastes being held for commercial waste disposal or recycling will be stored in Accumulation areas and removed.

*As soon as a chemical is declared a waste or removed from a satellite accumulation area, the accumulation date must be added to the label, in addition to the chemical name and hazard associated with the chemical. See Labels below.*

#### *2. Satellite Accumulation Areas*



## ABC Midwest Solutions 2022 Safety Program

Wastes from routine processes may be accumulated at or near their point of generation before consolidation at a designated storage area. The satellite area must be under the control of the generator and secure at all times. As much as 55 gallons of dangerous (hazardous) waste or one quart of extremely hazardous waste per waste stream may be collected. When the containers are full or volumes reach these limits, containers must be immediately marked with an accumulation start date, and moved to the accumulation storage areas within three (3) days.

### *3. Storage Time*

Because ABC MIDWEST SOLUTIONS, LLC is a regulated medium quantity generator of hazardous wastes, most hazardous materials cannot be held longer than 180 days in the storage areas. Acutely hazardous wastes in excess of the QEL of 2.2 lb. can be held only 90 days.

### *4. Containers*

Each hazardous waste must be stored in containers appropriate for that material.

1. Specific categories of organic solvent wastes can be combined into a common collection vessel. Chemically compatible solvents can be accumulated into the same container.
2. Common, compatible solvents from the maintenance shops may be bulked into the same container or drum.
3. Other hazardous wastes should be collected, each in a separate container, using the smallest container to match the amount of the chemical waste generated.
4. All containers must be tightly capped or covered at all times and clearly labeled. If a funnel is used, the bung must be immediately replaced following use of the funnel.
5. Secondary containment must be provided for hazardous waste containers in accumulation areas.

### *5. Labels:*

As indicated in ABC MIDWEST SOLUTIONS, LLC's Hazard Communication Program, any vessel containing a hazardous material must be properly labeled at all times. This requirement is especially important in dealing with hazardous wastes, because if the material is unidentified, disposal may be very expensive, difficult, or even impossible. Hazardous waste labels must contain additional information as well.

Labels on all containers of hazardous chemicals must include at least:





## ABC Midwest Solutions 2022 Safety Program

1. Term “Hazardous Waste” or “Dangerous Waste”
2. Chemical name of the hazardous material. The chemical name must be in English and must not be abbreviated. Names such as “Sample 1, Run 2” or names referring to page numbers in laboratory books are not acceptable. Rather than using chemical formulas to identify wastes, the generator must name the compound in English, even if the name refers to the starting material in a reaction (e.g., “diethylmalonate derivative” or “aniline/diethylamine reaction mixture”).
3. Chemical risk or hazard of the material (e.g., corrosive acid, ignitable, toxic) must be marked on the label.
4. Accumulation start date. This is the date that the container or drum was placed in the Accumulation area.

Standard hazard labels are available from safety supply companies. The Chemistry Laboratory Supervisor, the Environmental Services Coordinator, and Environmental Health & Safety will maintain a stock of labels for use by all areas. See Appendix B for examples of labels that are available on request and Appendix C for labels that you can print out.

### *6. Scheduling*

Environmental Health & Safety will arrange for the disposal of all hazardous wastes by a commercial waste disposal or recycling company. Disposal dates will be scheduled in consultation with the Chemistry Laboratory Supervisor and Office of Sustainability and other waste generators at ABC MIDWEST SOLUTIONS, LLC and in keeping with regulatory time requirements.

### **Inspection of Accumulation Areas**

The Chemistry Laboratory Supervisor and the Environmental Services Coordinator will conduct a weekly inspection of the hazardous waste Accumulation area(s)

### **Manifests**

The EHS Manager or the Chemistry Laboratory Supervisor may sign manifests. The manifests and supporting documents will be filed in the home Office. ABC MIDWEST SOLUTIONS, LLC will report to itself when manifests are not returned within 45 days from shipment.

### **Emergency Response and Preparedness**



## ABC Midwest Solutions 2022 Safety Program

ABC MIDWEST SOLUTIONS, LLC is required to prepare for emergencies associated with handling of hazardous wastes. ABC MIDWEST SOLUTIONS, LLC will be responsible for ensuring that the following information is posted and equipment is present and working at the Accumulation areas. Post near accumulation area:

1. Location of Emergency Coordinator and phone number
2. Location of Fire Extinguisher
3. Location of Spill Control
4. Location of Fire Alarm
5. Contact 911 in an emergency

Test and maintain safety equipment:

1. Communication equipment
2. Alarm System
3. Maintain 30" aisle space

### **Special Waste Categories:**

#### ***Photographic Chemicals***

Photographic fixer solutions cannot be disposed into the sewer. All photographic chemicals may be sewer disposed. The word "Toxic" must be marked or labeled on the drum.

#### ***Paints***

Latex paints may be disposed into the regular trash, if they are dry and solidified and the lid to the can is removed. Materials such as sawdust, vermiculite, or Portland cement may be stirred into latex paint to encourage the drying and solidifying process. The material may also be bulked for disposal.

All oil-based paints are considered hazardous materials and must be disposed through the hazardous waste disposal process. However, oil-based paints may be poured into an accumulation drum for bulk disposal.

#### ***Batteries (not including lead acid), Mercury-containing Thermostats, and Spent Lamps:***

These items designate as dangerous wastes, but can be managed as "Universal Wastes", which reduces the regulatory burden for handling. Use data sheets from



## ABC Midwest Solutions 2022 Safety Program

manufacturers to determine which lamps designate as dangerous waste. Some lamps are “green” and do not designate and do not require special handling

ABC MIDWEST SOLUTIONS, LLC is a small quantity handler of universal wastes because we accumulate less than 11,000 pounds of all universal waste types or less than 2200 pounds of spent lamps at any time.

The following must be followed when handling these wastes:

1. Unless actively adding or removing contents containers must be closed at all times.
2. Labels must state “Universal Waste” and the content, such as “Batteries” or “Lamps”.
3. Container, regardless of storage or accumulation location, must be labeled with the date the first item went into the container.
4. Accumulation, regardless of location, is limited to one year.

### ***Electronic Wastes***

This applies to televisions and computer monitors that contain cathode ray tubes (CRT). Other electronic wastes that designate as dangerous waste can also be managed under the State of Wisconsin Program; however, since ABC MIDWEST SOLUTIONS, LLC lacks CRT's, this is a mute point.

Recycling includes remanufacturing the components into new products, smelting, or salvaging usable parts.

The following must be followed when handling these wastes:

- . Accumulation is allowed up to 180 days. ABC MIDWEST SOLUTIONS, LLC requires a start date on the accumulation container to verify that we are not holding these materials longer than 180 days.
  - a. Use a recycling vendor that has notified upper management of its activity in writing. Request a copy of the vendor's letter to upper management for verification.

### ***Biohazards***

Biohazardous materials will be managed according to ABC MIDWEST SOLUTIONS, LLC's *Bloodborne Pathogen and & Infectious Waste Management Program*.

Biohazardous materials, including syringes and sharps containers that are will be autoclaved before disposal. A vendor will handle these materials. All biohazardous



## ABC Midwest Solutions 2022 Safety Program

materials must be packaged in orange or red plastic bags and conspicuously marked with the biohazard ABC MIDWEST SOLUTIONS, LLC Hazardous Waste Management – sign. Call the home office for pick-up of all Biohazard containers for disposal.

### *Animal Carcasses*

Animal carcasses, either fresh or preserved, cannot be disposed into the regular trash. Call ABC MIDWEST SOLUTIONS, LLC for pick-up and disposal of all animal remains.

### *Radioactive Wastes*

Radioactive wastes are not included in this program. For more information on the proper handling and disposal of radioactive materials, see the ABC MIDWEST SOLUTIONS, LLC Radioactive Materials Procedure Manual or speak with the Radiation Safety Officer in RSC.

### *PCB Light Ballasts and other PCB Items*

PCBs are regulated under the Toxic Substances Control Act or TSCA. PCB items that contain less than 50 ppm and greater than 2 ppm are regulated by Wisconsin State under the dangerous waste regulations. Equipment that is labeled “non-PCB” indicates that it contains less than 50 ppm PCB.

Ballasts manufactured before July 1, 1979 should be assumed to contain PCBs, unless credible documentation is available to state otherwise. This might include manufacturer’s specifications or MSDS. Fluorescent light ballasts that contain less than 2 ppm of PCB were required to be labeled “No PCB” by the manufacturer if manufactured after July 1, 1979 and before July 1, 1998. After July 1, 1998, no marking was required.

PCB light ballasts must be marked with the out of service date or the disposal container may be marked with the out-of-service date of the first ballast that goes in the container.

PCB items must be shipped within one year of the out-of-service date.

For disposal of other wastes not listed, call ABC MIDWEST SOLUTIONS, LLC.

### *Separation from ABC MIDWEST SOLUTIONS, LLC*

Employees who are leaving ABC MIDWEST SOLUTIONS, LLC work stations, studio or shop of hazardous materials, and this activity must be signed off by the Chemical Hygiene Officer or the Environmental Health & Safety Officer on the Human Resources Out-processing form.



## **Distribution**

This Hazardous Waste Management Plan will be included in ABC MIDWEST SOLUTIONS, LLC's *Occupational Health, Safety and Accident Prevention Manual*.

### Resources:

National Research Council. *Prudent Practices in the Laboratory*; National Academy Press: Wisconsin, DC., 1995

Task Force on Laboratory Waste Management. *Laboratory Waste Management: A Guidebook*; American Chemical Society: Wisconsin, DC, 1994.



## 20. GHS Written Training Program

### **GHS Written Training Program**

#### **PROGRAM INTRODUCTION**

Recent changes in OSHA's Hazard Communication Standard brought the regulation in line with international standards through the creation of the Global Harmonizing System (GHS). Implementing the Global Harmonizing System, helps ensure quality and consistency in the classification and labeling of all chemicals; improving an employee's ability to quickly understand critical safety information.

This program is designed to assist ABC Midwest Solutions, LLC (ABC MIDWEST SOLUTIONS, LLC) employees in understanding three key elements of the GHS: Hazard Classification, Container Labeling and Safety Data Sheets. Other topics in this program include: The Written Hazard Communication Plan, Physical and Health Hazard Classes, Pictograms, Signal Words and other information found on GHS Container Labels and Safety Data Sheets.

#### **PROGRAM OBJECTIVES**

After reviewing this program, the employee will be able to explain the following:

- What the written hazard communication plan and the Global Harmonizing System are;
- What health and physical hazard classes are;
- What information can be found on GHS chemical container labels;
- What a Safety Data Sheet is and when it should be consulted.

#### **PROGRAM OUTLINE**

##### **BACKGROUND**

- Hazardous chemicals are utilized by ABC MIDWEST SOLUTIONS, LLC staff, faculty, and students in various occupational and academic endeavors throughout the University. Employees and students handle, use, or work around these potentially harmful substances.
- Effects from exposure to hazardous chemicals can range from mild skin or eye irritation to severe burns to death from various types of exposure.



### ABC Midwest Solutions 2022 Safety Program

- Because of the dangers presented by hazardous chemicals, The Occupational Safety and Health Administration (OSHA) developed the Hazard Communication Standard, CFR 1910.1200.
- OSHA's regulation requires companies to develop a Hazard Communication Program which communicates the hazards of workplace chemicals to all employees.

### **THE WRITTEN HAZARD COMMUNICATION PLAN & THE GLOBAL HARMONIZING SYSTEM**

- ABC MIDWEST SOLUTIONS, LLC's Hazard Communication Program includes a written plan. This written plan specifies the policies, procedures and essential elements of the Hazard Communication Program such as container labeling, the collection, storage and availability of Safety Data Sheets, and an inventory with location listing all hazardous chemicals on-site.
- The written plan also details specific guidelines for the training of employees. For example, employees will receive specific training based on the hazardous chemicals to which they may be exposed.
- The written plan is an important document which all employees have a right to review upon request. OSHA's Hazard Communication Standard was first enacted in 1983; however, recent changes have brought the regulation more in line with international standards with the implementation of the Global Harmonizing System (GHS).
- Created by the international community and adopted by the United Nations, the GHS provides a single set of standardized criteria for classifying chemicals and mixtures according to their health, physical, and environmental hazards.

### **HAZARD CLASSIFICATION (SEE APPENDIX B)**

- Hazard Classification is the process of assigning a chemical or mixture to a hazard or danger category based on its health and physical hazards.
- Physical hazards are the properties of a gas, liquid or solid that could adversely affect you or the workplace in a physical way, such as a fire or explosion.
- Health hazards are determined by the properties of a substance or mixture that can cause illness or injury to the skin, eyes, lungs or other organs and body parts. Because there are such a large variety of hazardous chemicals, there are also a large variety of physical and health hazards presented by these chemicals.



## ABC Midwest Solutions 2022 Safety Program

- To better communicate the specific information needed by chemical workers, the Global Harmonizing System has created multiple classes of hazards. There are 16 classes of physical hazards and 10 classes of health hazards.
- The 16 classes of physical hazards include: explosives, flammable gases, aerosols, oxidizing gases, gases under pressure, flammable liquids, flammable solids, self-reactive substances, pyrophoric liquids, pyrophoric solids, self-heating substances and mixtures, substances and mixtures emitting flammable gases when contacting water, oxidizing liquids, oxidizing solids, organic peroxides, and substances corrosive to metal.
- The 10 classes of health hazards include: acute toxicity, skin corrosion and irritation, serious eye damage or eye irritation, respiratory or skin sensitization, germ cell mutagenicity, carcinogenicity, reproductive toxicology, specific target organ toxicity from a single exposure, specific target organ toxicity from repeated exposures, and aspiration.

### CONTAINER LABELS (SEE APPENDIX A)

- - Container labels will provide information on the relevant hazard classifications of the chemical. As part of the Global Harmonizing System, chemical manufacturers and importers are required to provide a label that includes a pictogram, signal word, hazard statements, and precautionary statements for each hazard class and category.
  - Your specific chemical training, as well as your company's written plan, will include an explanation of the pictograms associated with the chemicals in your work environment. This knowledge helps workers quickly identify a chemical's hazards and is the first step to taking proper precautions to work safely.
  - Pictograms are standardized graphics, sometimes called harmonized hazard symbols, which are assigned to a specific hazard class or category. Pictograms on a GHS label may convey health, physical or environmental hazard information.
  - Each pictogram is assigned to only one class of hazard. A pictogram will represent either a physical hazard, health hazard or environmental hazard.
  - Keep in mind that there is not a unique pictogram for each individual hazard within each class. In other words, one pictogram may be used to represent several hazards within a class.





**PHYSICAL HAZARD PICTOGRAMS (SEE APPENDIX A & B)**

- There are five pictograms displayed on GHS labels to represent physical hazards of a chemical.
- The exploding bomb pictogram is used to signify a material as explosive, unstable explosive organic peroxide, or a self-reactive substance or mixture.
- The flame pictogram is used for flammable gases, liquids, solids and aerosols as well as self-reactive substances. It may also indicate a material is an organic peroxide, pyrophoric liquid or solid, a self-heating substance or mixture or emits flammable gases when it makes contact with water.
- The flame over circle, or oxidizer pictogram, appears on a label when a chemical is an oxidizing gas, liquid or solid.
- The gas cylinder pictogram is exhibited when a substance is a compressed, liquefied, refrigerated liquefied or dissolved gas.
- The corrosion pictogram indicates a material is corrosive to metal.

**HEALTH HAZARD & ENVIRONMENTAL PICTOGRAMS (SEE APPENDIX A)**

- There are four pictograms displayed on GHS labels to represent health hazards of a chemical.
- The corrosion pictogram is used to denote the health hazards of skin corrosion and serious eye damage.
- The skull and crossbones are used when a chemical is acutely toxic to the skin, lungs or digestive system.
- The health hazard pictogram, sometimes called the chronic health hazard pictogram, denotes respiratory sensitization, cell mutagenicity, carcinogenicity, reproductive toxicity or an aspiration hazard. It is also used when a substance can cause specific target organ toxicity following a single or repeated exposure.
- The exclamation point pictogram is used for the health hazards of acute toxicity, skin irritation, eye irritation, skin sensitization and specific target organ toxicity following a single exposure in the form of narcotic effects or a respiratory tract infection.
- The environmental hazard pictogram is used when a substance poses acute or chronic hazards to the aquatic environment.

**SIGNAL WORDS (SEE APPENDIX A)**



## ABC Midwest Solutions 2022 Safety Program

- There are two signal words that appear on GHS container labels. The words “Danger” or “Warning” are used to emphasize hazards and indicate the relative level of severity of the hazard.
- “Danger” represents a more severe hazard than the signal word “Warning”.
- Only one signal word, corresponding to the class of the most severe hazard, should be used on a chemical label.

### HAZARD & PRECAUTIONARY STATEMENTS (SEE APPENDIX A)

- Other standardized communication elements found on GHS container labels are Hazard Statements and Precautionary Statements. For products which pose more than one risk, an appropriate hazard statement for each GHS hazard will be included on the chemical label.
- Hazard Statements are standard phrases assigned to a hazard class and category that concisely describe the nature of the hazard.
- Precautionary Statements are standardized explanations of the measures to be taken to minimize or prevent adverse effects.
- There are four types of precautionary statements for each hazard class: prevention, response, storage and disposal.
  - Some examples of “Prevention” precautionary statements include “Do not allow contact with water” and “Wear protective gloves.”
  - Some examples of “Response” precautionary statements include “If on skin wash with plenty of water” and “If inhaled remove person to fresh air.”
  - Some examples of “Storage” precautionary statements include “Store in well ventilated place” and “Protect from sunlight.”
  - “Disposal” precautionary statements typically state to “Dispose in accordance to local regulations”. Disposal precautions are an area the United Nations plans to further develop in the future.

### SAFETY DATA SHEETS (SEE APPENDIX C)

- Required by OSHA’s original Hazard Communications Standard, Material Safety Data Sheets have been the comprehensive source of safety information about specific chemicals; unfortunately, these documents came in a wide variety of styles and formats making them hard to read and understand quickly.



## ABC Midwest Solutions 2022 Safety Program

- As part of the Global Harmonized System, they are now called “Safety Data Sheets” and have a uniform 16 section format that allows employees to obtain concise, relevant and accurate information more easily:
  - Chemical Identification; Hazard(s) identification; Composition/ information on ingredients;
  - First-aid measures; Fire-fighting measures; Accidental release measures; Handling and storage
  - Exposure control/ personal protection; Physical and chemical properties; Stability and reactivity;
  - Toxicological information; Ecological information; Disposal considerations; Transport information;
  - Regulatory information; and Other information
- Your facility maintains a Safety Data Sheet for every chemical in the workplace as part of its Hazard Communication Program, You should review the SDS before working with any chemical or anytime you have concerns about safety issues.
- Always ask your supervisor if you have any questions about a chemical label or Safety Data Sheet.

### **PERSONAL PROTECTIVE EQUIPMENT (SEE APPENDIX A & C)**

- Always wear the proper protective equipment specified by the container label or Safety Data Sheet. This often includes wearing gloves, protective clothing and goggles with a face shield.
- Respiratory protection may also be required to avoid breathing in hazardous fumes.
- If you are unsure about the required PPE for any chemical, stop and ask your supervisor.