



INDOT SAFETY AND HEALTH POLICY SEPTEMBER 1, 2016

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Safety and Health Policy Foreword

Responsible Department: Statewide Safety

Last Updated: 2016

Safety and Health Policy Manual Foreword

The INDOT Safety and Health Policy for 2016 is a guide for safe practices for you and your whole team. Compiled together over the course of the last year, this document seeks to provide resources to ensure you and your fellow employees go home in the same condition you came to work every day. While this guide is full of information, we've grouped the various policies topically for ease of use.

This document is a revision of INDOT's 2014 Safety Manual. The revised document builds upon the processes described in the previous manual and draws from the lessons learned since its creation. New information and techniques that reflect advances in safety and health, including tools and resources available to INDOT employees, are also presented.

The document emphasizes a team approach and the importance of careful planning, coordination, and communication throughout the work day. INDOT recognizes that effective safety and health processes often require the cooperation and coordination of full teams of individuals working towards a common goal.

INDOT is committed to updating the manual as new information becomes available. The agency welcomes comments from users of the document. Just click [this link](#) to send any suggestions you have for revising the Safety and Health Policies.

INDOT is truly committed to Taking Care of What We Have. That's not just our roads, bridges, and equipment. By far, our most valuable asset is you. Help us do that together.

A handwritten signature in cursive script that reads "Brandye Hendrickson".

Brandye Hendrickson

Indiana Department of Transportation Commissioner



Commercial Driver's License Policy

Responsible Department: Statewide Safety

Last Updated: 2016

Commercial Driver's License Policy

Section 1: Who Needs a CDL?

Types of Vehicles that require a CDL

You must have a commercial driver license (CDL) to drive any of the following vehicles:

- All single vehicles with a manufacturer's weight rating of 26,001 pounds or more.
- All trailers with a manufacturer's weight rating of 10,001 pounds or more, and a combined vehicles' gross weight rating of 26,001 pounds or more.
- All vehicles used to transport any material that requires hazardous material placarding or any quantity of a material listed as a select agent or toxin in 42 CFR 73.

Indiana Department of Transportation CDL Requirements

The Indiana Department of Transportation requires certain job classifications to possess a CDL as part of their job description. Please go to the link [Possession of a Commercial Driver's License Policy](#) to see the requirements, as well as the job positions that must obtain and keep a valid CDL at all times.

Find Out if You Need a CDL

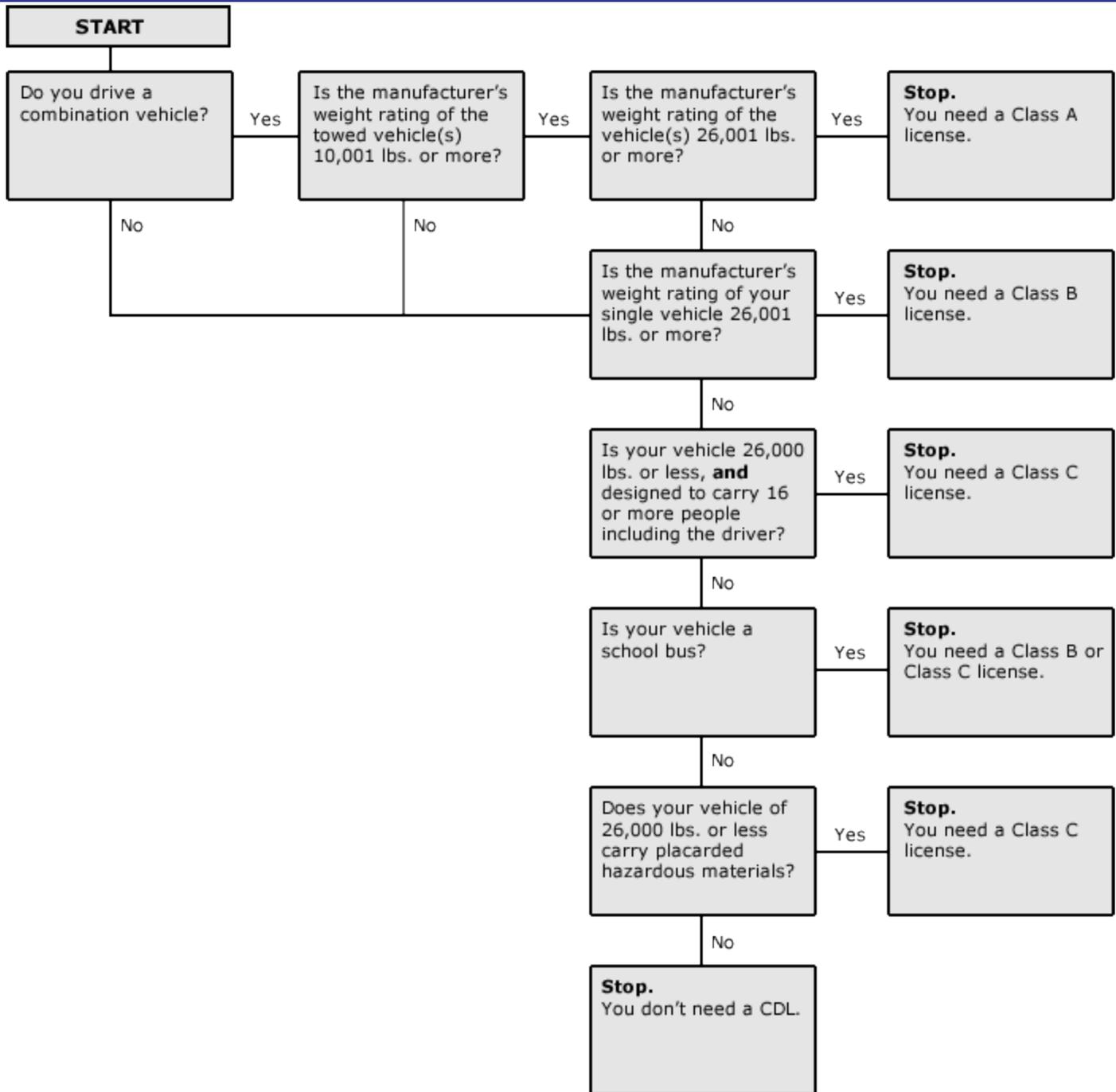
The vehicles described above are divided into 3 classes: Class A, Class B, and Class C. Use the diagram below to see if you need a CDL, and what class of CDL you need. A higher-class CDL allows you to drive vehicles in any of the lower classes if you have the correct endorsements.



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Section 2: CDL's and Endorsements

Types of CDLs

Commercial vehicles are divided into 3 size classes: A, B, and C.

CDL class	What you can drive
A	<ul style="list-style-type: none"> Single or combination vehicles of any size.
B	<ul style="list-style-type: none"> Single vehicles of any size. Vehicles towing a trailer with a weight rating of 10,000 pounds or less. Any vehicles listed under Class C, if properly endorsed.
C	<ul style="list-style-type: none"> Vehicles carrying 16 or more persons including the driver.* Vehicles carrying hazardous materials with a weight rating of 26,001 pounds or less.*

* Requires a [special endorsement](#)

Endorsements and Restrictions

Each endorsement or restriction requires the commercial driver to pass specific tests.

Endorsement or restriction	Description
Double/triple trailers endorsement (T)	Required for drivers pulling sets of double or triple trailers.
Tank vehicle endorsement (N) (See specific information regarding this endorsement below) **	Required for drivers of vehicles carrying liquids or liquid gases in portable or fixed tanks. This endorsement isn't required for portable tanks with a rated capacity under 1,000 gallons.
Hazardous materials endorsement (H)	Required for drivers of vehicles carrying the types of hazardous materials that require the vehicle to be classified or placarded for hazardous materials. This endorsement requires drivers to be fingerprinted and undergo a federal background check the first time they get an HME, or when they renew or transfer a license from another state.



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Combination endorsement (X)	This is a combination of a tank and hazardous materials endorsement.
Air brake restriction (K)	This is an automatic restriction. If a driver has successfully passed the necessary written and driving tests for air brake equipped vehicles, this endorsement will be removed. Drivers who don’t pass these tests are restricted on the CDL to non-air brake vehicles.

You may also need a special endorsement if you will:

- Haul [hazardous materials](#).
- Drive double-trailer, triple-trailer, or tank vehicles.

** INDOT has certain drivers in the districts that have been required to operate tanker trucks and we have required these drivers to get the “N” endorsement on their CDL. The Federal Motor Carrier Safety Administration has issued a final ruling on defining what constitutes the requirements for CDL drivers to obtain the tanker endorsement. Any CMV designed to transport any liquid or gaseous material within a tank or tanks having an individual rated capacity of more than 119 gallons and an aggregate capacity of 1000 or more gallons that either permanently or temporarily attach to the vehicle or chassis requires a CDL. INDOT’s snow plows have a “pre-wet” system with tanks in the 200 to 250 gallon range. All current employees required to maintain a CDL and future hires into these positions are required to obtain the tanker “N” endorsement. There is a twelve question test that the employee will have to take and pass over the following:

- Cause, prevention, and effect of cargo surge on motor vehicle handling
- Proper braking procedures for the motor vehicle when it is empty, full and partially full
- Differences in handling of baffled/compartmental tank interiors versus non-baffled motor vehicles
- Differences in tank vehicle type and construction
- Differences in cargo surge for liquids and varying product densities
- Effects of road grade and curvature on motor vehicle handling with filled, half-filled, and empty tanks
- Proper use of emergency systems
- Retest and marking requirements for drivers of DOT specification tank vehicles

INDOT will reimburse all current employees for taking the test and getting the “N” endorsement. If the employee fails the first test, the employee will be responsible for paying for any and all re-tests. Written material regarding this endorsement is in the CDL manual and also online.

Section 3: Steps to Getting a CDL

Below is the approved Standards Operating Procedure regarding the Commercial Driver’s License physical that should be utilized beginning July 1, 2016:



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Commercial Driver's License Standard Operating Procedure

Purpose

To establish a procedure for employees to receive a DOT Physical Exam who are required to obtain and maintain a valid Commercial Driver's License, as specified in the Indiana Department of Transportation's "Possession of a Commercial Driver's License Policy".

Procedure

All DOT Medical Exams must be performed by a certified Medical Examiner listed on the Federal Motor Carrier Safety Administration (FMCSA) National Registry. Each INDOT District Office and Central Office maintains a list of physicians who are certified to perform the DOT Medical Exams. Employees may contact their respective Human Resources Department and request that they set up appointment for the employee to receive a DOT Physical Exam prior to the expiration date of their current DOT Physical Exam. Employees may also contact their respective HR designee for the names of the specified physicians so they may make an appointment for themselves. Appointments are scheduled by HR or the designated administrative staff in the District or Subdistrict office as appropriate.

INDOT will pay for the employee's DOT Physical Exam providing the employee goes to a FMCSA certified Medical Examiner as recommended by HR. If an employee goes to their own Medical Examiner, who is required to be FMCSA certified, that was not specified by HR, employee will be required to pay the cost of such DOT Medical Exam themselves. Additionally, INDOT will only pay the cost of the initial DOT Physical Exam. If there are follow-up visits or any additional medical testing that is required as the result of the initial DOT Physical Exam, cost of such follow-up or additional testing will be the employee's responsibility. Such additional testing may or may not be covered by the employees selected health plan and they should contact their health insurance provider

INDOT will only pay the cost of a DOT Physical Exam for an employee once every year or once every two years, based upon the Certification Status. If an employee is only certified for three or six months and is required to return to the Medical Examiner for periodic monitoring in order to extend the length of their DOT Physical Exam to maintain their CDL, INDOT will not pay for those additional visits.

Upon receiving the Medical Examination Report (MER) and the Medical Examiner's Certificate (MEC), both documents shall either be taken to a BMV office or faxed to the BMV at (317) 974-1613. The Medical Examiner's Certificate must be provided to the appropriate HR person in the District and Central office for the employees CDL file.

Medical Examination

Before applying for your first CDL or Commercial Learner's Permit (CLP) you must provide a valid MER and an MEC. All medical examiners must be certified by the FMCSA National Registry of certified medical examiners. For information on the FMCSA National Registry of Certified Medical Examiners, visit:

- [National Registry of Certified Medical Examiners Rules and Regulations](#)
- [Find a Certified Medical Examiner](#)

Beginning April 20, 2016 the current FMCSA approved MER form, MCSA-5875 and MEC form MCSA-5876" provided to the potential CDL candidate by the certified medical examiner must be



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provided to the BMV for updating the medical status. Any failure to provide these documents will result in the medical status of Not Certified and the downgrade of any CLP or CDL to basic license privileges only.

For further information on the medical requirements please visit the FMCSA National Registry of Certified Medical Examiners or Resources for Drivers on the FMCSA website:

- [FMCSA National Registry of Certified Medical Examiners](#)
- [FMCSA Resources for Drivers](#)

For medical information and federal applications visit the [FMCSA website](#). There is information on a variety of medical topics such as insulin or vision exemption and skills performance evaluations. INDOT will reimburse employees required to have and maintain a CDL as part of their job for the cost of the medical exam.

Use one of the following options to submit the completed MER and MEC to the BMV:

- Fax to 317-974-1613 (INDOT employees can take MER and MEC to the HR department and they will fax them for you)
- Submit documents to any BMV branch
- Mail to:
 - Indiana Bureau of Motor Vehicles
Attn: CDL Programs
100 N. Senate Ave
IGCN, Room N 481
Indianapolis, IN 46204

In addition to the BMV, INDOT is required to keep a file on all items related to your CDL. INDOT also requires a copy of your MEC. Employees will supply copies to their respective Human Resources representatives.

Documents of Identification

You must be either a United States citizen or lawful permanent resident to apply for a CDL or CLP per 49 CFR 383.71

When applying for a CLP or CDL you must present the following identification:

- One document proving your identity
- One document proving your Social Security number
- One document proving your lawful status in the United States
- Two documents proving your Indiana residency

Acceptable documents can be found on the [BMV's Website](#).

Knowledge Examination and Skills Testing

To obtain a CDL in Indiana, you must pass a knowledge examination and a driving skills test in a vehicle representative of the class of CDL that you will receive. The driving skills test must be taken at a BMV authorized test site and consists of a pre-trip inspection test, a basic control skills test, and the road trip test. INDOT will provide all training necessary for an employee required to have a CDL as part of their job.



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The CDL knowledge tests will be based upon the [Commercial Driver's License Manual, 2005 CDL Testing System \(July 2014\)](#).

For employees who were in the Military, the BMV may waive the required drive skills test for select veterans of the U.S. Armed Forces with specific drive training, and those who were truck drivers during their military service, when they apply for an Indiana CDL after issuance of a CLP. You can find further information at the [BMV's website](#).

In addition to the BMV, INDOT is required to keep a file on all items related to your CDL. INDOT also requires a copy of your CDL. Employees will supply copies to their respective Human Resources representatives.

Section 4: Renewing an Indiana CDL

A CDL issued in Indiana is valid for four years. You may renew your CDL at an Indiana license branch up to one year before the license expires.

Drug and Alcohol Testing

All current and prospective INDOT employees that are in a CDL or testing designated position are subject to pre-employment drug testing and random drug and alcohol testing, as well as unsafe practice testing, post-accident testing, and reasonable suspicion testing. Employees with a CDL will be subject to a US DOT test. INDOT drug and alcohol tests 25% of their employees required to have a CDL yearly, and tests 10% of their testing designated positions annually, all done on a random basis.

For further information please use the links below:

- [Drug and Alcohol Testing Policy](#)
- [Drug and Alcohol Testing Policy 2014 Supplement](#)
- [Drug and Alcohol Testing Policy Definitions](#)

Suspension of CDL/Driver's License

INDOT employees, whose job requirements include maintaining a valid state driver's license or CDL and have their license suspended or revoked, may be dismissed from employment. For further information regarding please see the [Suspended/Revoked Driver's License or CDL policy](#). Additional Resources and Frequently Asked Questions

Section 5: Additional Resources and FAQ

Additional Resources

[Federal Motor Carrier Safety Administration](#)

[Bureau of Motor Vehicles for State of Indiana](#)

[Indiana State Police](#)

Frequently Asked Questions about CDL and CDL Physicals

What is a "K" license?

There is no "K" license; however, there is a "K" endorsement on CDL's that restricts the driver to intrastate only. That means a CDL with a "K" restriction is valid only in the issuing state. If you



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have a CDL issued by the State of Indiana and it has the "K" restriction you may only use it to drive commercial motor vehicles inside the state.

Can I chose what physician I go to for my CDL physical?

You may choose a physician to go to for a CDL physical as long as the medical examiner is listed on the National Registry of the Federal Motor Carrier Safety Administration. In accordance with INDOT's Possession of a Commercial Driver's License policy: "Employees requiring a physical for purposes of obtaining and/or maintaining their CDL must contact their Human Resources Department to schedule a DOT Physical Exam if they request INDOT to cover the cost of obtaining the Medical Examination. The employee will be instructed as to which physician they will use for the examination. If an employee chooses to use an alternate medical examiner, not approved by INDOT, the employee will incur the cost of the DOT Exam."

Does INDOT pay for more than one CDL physical per year?

No, INDOT will only pay for one DOT Medical Exam per year.

Does INDOT pay for additional medical tests or procedures as a result of my CDL physical?

No. In accordance with INDOT's "Possession of a CDL Policy" All procedure costs outside the scope of the standard DOT CDL physical examination, will not be covered by INDOT and subsequently will be a cost incurred by the employee. An employee may be able to use their Health Care Plan through the state to pay for any additional tests or procedures. Employees should contact the State of Indiana Benefits Hotline at 317-232-1167 within Indianapolis or Toll Free outside Indianapolis at 1-877-248-0007

What is the process & status of my employment if I don't pass my CDL physical?

If you are in pre-employment status and fail to pass your DOT medical examination, you will not be extended an offer of employment. If you are a current employee in a highway technician position who has completed their probationary period and fail your DOT medical exam, then your CDL is suspended and you will have 60 days from notification of disqualification to get your CDL reinstated. If at the end of the 60 days the employee has not had the CDL reinstated, they will be terminated or receive consideration for placement in other INDOT positions for which they qualify, if such positions are available.

Who is responsible for providing a copy of my CDL physical to the Bureau of Motor Vehicles?

It is the employee's responsibility to provide the BMV a copy of their DOT medical examiner's report as well as the MEC. Employees may these documents to any local BMV office or you can fax then to the BMV at 317-974-1613. If the employee wishes they may take these documents to their respective HR representative and they will fax them to BMV on your behalf

What do I provide to Human Resources?

HR must have a copy of your actual Commercial Driver's License and also a copy of your most recent DOT MEC for your file.



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What do I need to carry with me regarding the CDL?

Your license and also your MEC should be on your person at all times while performing work requiring a CDL

What happens if I cannot pass my skills test?

Newly hired employees have 90 days from date of hire to acquire their CDL. INDOT will provide both skill and knowledge training for the new hire. If the newly hired employee fails to pass the skills test, they will receive additional training to attempt to pass the skills test again. If new hire fails to pass the skills test and not receive a CDL within the initial 90 days, employee will be terminated

Does INDOT pay for the CDL, the actual license?

Employees will be reimbursed for the BMV fees associated with the CDL including any special endorsements that INDOT may require. In the districts, contact your Human Resources representative on what the procedure is to process your reimbursement. In Central Office, you will need to contact the administrator in your business unit who processes invoices for your group. INDOT will only reimburse employees for the initial CDL, any endorsements required or regular renewals. If an employee loses their CDL due to their own negligence or for medical reasons, INDOT will not reimburse employee for any renewal fees of their CDL.

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Confined Space

Responsible Department: Statewide Safety

Last Updated: 2016

Confined Space

Definitions

Confined Space

A space that is large enough, and so configured, that an employee can bodily enter and perform assigned work; and has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and is not designed for continuous employee occupancy. (1910.146)

Non-Permit Confined Space

A 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.

Permit Required Confined Space (Permit Space)

A confined space that has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere
- Contains a material that has the potential for engulfing an entrant
- 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
- Contains any other recognized serious safety or health hazards.

Prior to entering confined spaces, Employees shall use Alternative Procedures worksheet or Reclassifying Permit Space worksheet. Worksheets can be found on the Safety Web and shall be kept for a period of one year.

Alternative Procedures

The OSHA regulations allow permit spaces which have as their only hazard an actual or potential hazardous atmosphere to use alternative procedures for entry. These alternative procedures do not require the implementation of a full PRCS program.

Reclassifying Permit Space to Non-Permit Space

The OSHA regulations also allow permit spaces to be reclassified as non-permit spaces by the total elimination of hazards. A permit space can be reclassified as a non-permit space if there are no actual or potential atmospheric hazards and if all the other hazards within the space are eliminated without entry into the space.

Prevention of Unauthorized Entry

If permit spaces are identified at a worksite, safety director will inform exposed or potentially exposed employees of their existence and hazards. Signs shall be posted on all permit confined spaces stating "NO ENTRY".

Section 1: Responsibilities

This program is designed to identify Confined Spaces and Permit Required Confined Spaces (PRCS) and to eliminate or control hazards associated with operations.



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Employees shall not enter any Permit Confined Space that cannot be entered by alternative procedures or reclassified as a Non Permit Confined Space.

INDOT Responsibilities with Contractors (PRCS)

When contractors are involved in permit space entry work at a worksite, the supervisor of the worksite and Safety Director will inform the contractor of the following information:

- The location of the permit spaces at our facility and those entries into these spaces are only allowed through a permit space program, alternative procedures, or space reclassification.
- Our rationale for listing the space as a permit space which has any identified hazards and our experiences with the particular space.
- Precautions that we have implemented to protect employees working in or near the space.
- Safety Director and/or Supervisors will debrief the contractor at the completion of entry operation, or during if a need arises, and if any hazards were confronted or created during their work.

Contractor's Responsibilities with INDOT (PRCS)

When a contracting company is hired to perform work in a PRCS, ensure the following tasks are performed:

- Will inform INDOT of the permit space program that will be utilized.
- Provide documentation that each member of the PRCS has received all required training for entrance into a PRCS.
- Provide documentation that each member of PRCS rescue team is appropriately trained and that at least one member is certified in first aid/CPR. If an outside service is used the contractor must provide INDOT with the following information:
 - Name of Rescue Service
 - Telephone Number
 - Location
 - Approximate Response Time
- Hold a debriefing conference at the completion of the entry operation or during the entry operation (if needed) to inform the host employer of any hazards confronted or created.

Section 2: Training

Training shall be given to each employee who has access or potential access to a confined space. The amount and type of training needed will depend on the individual's duty assignment. The overall intent of this training is to give employees the understanding, knowledge, and skills necessary for the safe performance of their assigned duties in relation to confined spaces.

Awareness Training

Awareness training for employees potentially exposed to permit spaces can be satisfied by providing them with an overall review of our written program.

Training Required for Using Alternative Procedures

If the space qualifies for alternative procedures, training on the following topics shall be conducted:



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- A major point concerning the use of alternative procedures is that these procedures can only be used when a hazardous atmosphere is the only hazard of concern.
- The harm associated with the atmospheric hazards of concern including their acceptable entry levels and symptoms of overexposure.
- Awareness training to recognize other potential hazards in or around the space.
- Any condition which may make it unsafe to remove the entrance cover.
- The need of prompt guarding of the entrance opening.
- Atmospheric testing equipment including its use, method of calibration, and maintenance.
- Atmospheric testing protocol for oxygen, combustibles, and toxics.
- Before entry, frequent or continuous testing of the permit space.
- Check all levels of the space for atmospheric hazards.
- Atmospheric Controls
 - Inerting
 - Draining and rinsing
 - Purging
- Continuous forced air ventilation including type, proper use and placement, and its limitations.
- Procedures the employee must follow if a hazardous atmosphere is detected
- The evaluation process to be used for entry if a hazardous atmosphere is detected or the individual vacates the space and returns some later time.
- Train employees on the use of entry equipment used including ladders and intrinsically safe lighting.
- Personal protective equipment (e.g., gloves, hard hats, boots, etc), its use, limitations, and required maintenance.
- A review of the completed written certification form with the employee prior to entering the space.
- Any process which may introduce a hazard (e.g., welding, cleaning with chemical solvents, etc.) which would prohibit use of alternative procedures.
- The requirements of [1910.146](#) paragraphs (c)(5) must be reviewed with the employee.

Training Required for Using the Reclassifying Permit Space Procedures

If the permit space can be reclassified; training on the following topics shall be conducted:

- Documentation of the elimination of hazards. If the elimination of the hazards or verification of elimination requires employees to enter the space, then a full PRCS program is needed.
- Train employees on the hazards associated with the space (i.e. Mechanical, chemical, atmospheric) and the methods needed to eliminate the hazards as:
 - Isolation techniques
 - Lockout/Tagout
 - Disconnection and misalignment of pipes
 - Double block and bleed
 - Blanking and blinding
 - Removal of engulfment hazards



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- Elimination of hazardous atmosphere by draining, inerting, purging, cleaning, or venting
- Train employees on the use of entry equipment used including ladders, ground fault circuit interrupters for electrical equipment, etc.
- Personal protective equipment (e.g., gloves, hard hat, boots, etc.) including its use, limitations and required maintenance.
- A review of the completed written certification form with the employee entering the space.
- The requirements of paragraph (c)(7) must be reviewed with the employee(s).
- Inform employees that any procedures such as welding, cleaning with a chemical, etc. would negate the reclassification and convert space back to a permit space.
- Any conditions which may make it unsafe to remove entrance cover.
- The need for prompt guarding of entrance opening.
- Atmospheric testing equipment including its use, method of calibration, and maintenance.
- Atmospheric testing protocol
- Before entry, frequent or continuous testing
- Check all levels of the space.
- Procedures the employee will follow if a hazard is detected.
- The evaluation process to be used for re-entry if a hazard is detected of the individual vacates the space and returns some later time.
- Awareness training to recognize other potential hazards in our around the space.

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Electrical

Responsible Department: Statewide Safety

Last Updated: 2016

Electrical

Section 1: General

Safety-related work practices shall be employed to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts when work is performed near or on equipment or circuits which are or may be energized. Electrical Safety awareness, work activities, and training shall be in accordance with the most current applicable state and federal Occupational Safety and Health Administration (OSHA) regulations - General, National Fire Protection Association (NFPA) standards, National Electrical Code (NEC), and manufacturer recommendations. 1910.303

Additionally, Lockout/Tagout requirements shall be in accordance with the INDOT Facilities and Equipment Lockout/Tagout Policy and Procedures.

Only qualified employees are permitted to work on or near exposed energized electrical parts

Section 2: Training

Employees shall be trained and familiar with the safety-related work practices that pertain to their respective job requirements. 1910.332(b)(2)

Employees who are qualified workers (i.e. those permitted to work on or near exposed energized parts) shall, at a minimum, be trained in, and familiar with, the following: 1910.332(b)(3):

- The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment. 1910.332(b)(3)(i)
- The skills and techniques necessary to determine the nominal voltage of exposed live parts. 1910.332(b)(3)(ii)
- The procedures to follow when working on exposed live parts, or are near enough to them, to be exposed to any hazard they present. 1910.332(b)(3)(iii)

Section 3: Specific Requirements

Electrical equipment and circuits will be plainly labeled especially when two (2) or more voltages are used. Switches and outlets will be grounded. They will be of the UL approved enclosed type. 1910.303(g)(1)(iii)

Table S-1. -- Minimum Depth of Clear Working Space at Electric Equipment, 600 V or Less 1910.303(g)(1)(vi)(B)

Nominal voltage to ground	Minimum clear distance for condition ²³					
	Condition A		Condition B		Condition C	
	m	ft	m	ft	m	ft
0-150	¹ 0.9	¹ 3.0	¹ 0.9	¹ 3.0	0.9	3.0
151-600	¹ 0.9	¹ 3.0	1.0	3.5	1.2	4.0



Electrical

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Notes to Table S-1:

1. Minimum clear distances may be 0.7 m (2.5 ft) for installations built before April 16, 1981.
2. Conditions A, B, and C are as follows:
 - a. Condition 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 bus bars operating at not over 300 volts are not considered live parts.
 - b. Condition B -- Exposed live parts on one side and grounded parts on the other side.
 - c. Condition C -- Exposed live parts on both sides of the work space (not guarded as provided in Condition A) with the operator between.
3. 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. Where rear access is required to work on deenergized parts on the back of enclosed equipment, a minimum working space of 762 mm (30 in.) horizontally shall be provided.

Switch boards, fuse cut-out panels, motor control equipment and other current carrying equipment will be grounded.

A three (3) foot area shall be maintained at all times in front of all electrical panels, pull boxes and emergency shut-offs. It is recommended that this area be painted yellow.

All portable electric equipment shall be UL approved.

Portable electric equipment that does not have a three prong plug or is not double insulated shall be protected by GFCI. [1910.304\(b\)\(2\)\(iii\)](#)

Section 4: Safeguards for Personnel Protection

Employees working in areas where there are potential electrical hazards shall be provided with and shall use, personal protective clothing and equipment designed to keep them safe from electrical hazards. [1910.335, NFPA 70E](#)

Protective equipment shall be maintained in a safe, reliable condition and shall be periodically inspected or tested. [1910.335](#)

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Excavating and Trenching

Responsible Department: Statewide Safety

Last Updated: 2016

Excavating and Trenching

Section 1: General

INDOT trenching and excavation operations include but not limited to pipe repair, replacement, ditching, etc. All sites shall be safeguarded or supported as necessary to safeguard employees working in or around such conditions in accordance with [29 CFR 1926 OSHA Subpart P- Excavations 1926.65](#).

Section 2: Specific Requirements

Efforts shall be made to determine if there are underground utilities in the area prior to opening any excavation efforts. If utilities are found to be in the area then they must be located and protected during the excavating operations.

Soil Classification must be conducted and identified in accordance with *Appendix C*. Following are requirements when working around or in excavations:

- The sides of all excavations and trenches more than five (5) feet deep shall be guarded by a shoring system, sloping of the ground, or other equivalent means.
- In every trench four (4) feet or more in depth there shall be a means of egress (secured ladder, ramp, or stairway) located every twenty-five (25) feet.
- Where employees might be exposed to vehicular traffic, employees shall wear proper INDOT issued or approved Hi-Vis Safety Garments and personal protective equipment (PPE). Signs, signals, barricades and/or flagmen may be required.
- Employees are not permitted under elevated loads handled by earth moving equipment.
- All materials, tools, and equipment shall be stored at least two (2) feet or more away from the edge of the excavation.
- Adequate precautions shall be taken to prevent exposure to hazardous materials in the air or dangerous environments.
- If working in a bell bottom excavation, employees may be required to follow the work practices developed for confined spaces.
- Employees shall not work in excavations in which there is accumulated water, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation.
- Where the stability of adjoining buildings, walls or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.
- Employees who are not required to be involved in the excavation shall stay out of the excavated area.
- Remote excavations must be backfilled, covered or barricaded (wells, pits, etc.).
- Daily inspections of all excavations shall be made by a competent person. If there is any evidence of possible cave-in or slides are apparent, all work in the excavation site shall cease until the necessary precautions have been taken to safeguard the employees.
- All employees shall be provided with and required to use personal protective safety equipment such as: hard hats, safety goggles, ear plugs and any other required safety equipment.
- Extra shovels and other tools used for rescue shall be provided at the work site at all times.



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- The trench shall be refilled as soon as possible after the needed work has been performed.
- Care shall be taken with the movement of equipment and individuals around the open trench.
- Individuals shall stay away from the open trench, at a safe distance from the edges of the trench and the equipment filling area, until the trench has been filled to a safe level.

Emergency Response Plan

Plan for the worst and have a plan in place for requesting assistance from the nearest rescue/emergency medical services. In some locations, it may be faster to send someone for assistance if working nearby an emergency service center. Time is critical in rescue of a trapped victim.

Section 3: Protective Systems

Protective systems are used as a method of protecting employees from: cave-ins, material that could fall or roll into an excavation, or from the collapse of adjacent structures. Designing a protective system is a complex operation because of the factors involved and shall be in accordance with *Appendix C*.

Some of the considerations that must be taken into account are:

- Soil classification
- Depth of cut
- Water content of soil
- Changes due to weather and climate
- Superimposed loads (heavy equipment and materials)
- Vibrations
- Other operations in the vicinity

Types of Protective Systems

Sloping and Benching

A method of protecting employees from cave-ins by sloping the walls back to an angle. The recommended angle of repose is forty-five (45) degrees. For every one (1) foot dug down, dig back one (1) foot to equal a 1:1 ratio. If water or vibration exists or the soil is unstable, the angle of repose is approximately twenty-six (26) degrees to equal a 2:1 ratio. This is the most common method used by INDOT and can be limited due to inadequate right of way, utilities, property boundaries, etc.

Limitations of work area needs to be taken in consideration before excavation begins and detailed planning conducted. If adequate work area is limited, preventing proper sloping, then one of the following methods shall be utilized.

Shielding (Trench Boxes or Trench Shields)

A structure that is able to withstand the forces imposed on it by a cave-in, and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either manufactured or job-built. Placement of the shield should rest near the bottom of the trench and extend



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approximately 18 inches above ground and/or slope remaining depth of trench back 18 inches from the top of the trench box.

Shoring System

A structure such as an aluminum hydraulic, pneumatic/hydraulic, or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins. Aluminum hydraulic, pneumatic/hydraulic and timber shoring shall only be used in trenches that do not exceed twenty (20) feet in depth.

Section 4: Installation and Removal of Protection

Design of support systems, shield systems and other protective systems shall be selected and constructed by the competent person and shall be in accordance with Appendix C.

Whatever support system is used, employees shall always apply shoring by starting from the top of the trench or excavation and working down.

Care must be taken when installing shoring to place the cross beams or trench jacks in the true horizontal position and to space them vertically at appropriate intervals. The braces also must be secured to prevent sliding, falling or kick outs.

All materials used for shoring shall be in good condition, free of defects and of the right size. Timber with large or loose knots shall not be used.

Installation of the shoring shall closely follow the excavation work. The longer the trench is left unsupported, the greater the chance of a cave-in.

As soon as work is completed the trench shall be backfilled as the shoring is dismantled.

After the trench has been cleared, workers shall remove the shoring from the bottom up, taking care to release jacks or braces slowly.

In unstable soil, ropes shall be used to pull out the jacks or braces from above.

It is imperative the safety of personnel and the excavation site is maintained at the highest level of safe operation. Daily inspections of excavations shall be in accordance with Appendix C and be conducted to the adjacent areas and protective systems.

The inspection shall be made by a competent person for:

- Evidence of a situation that could result in possible cave-ins
- Indications of failure of protective systems
- Hazardous atmospheres, or other hazardous conditions
- Prior to the start of work
- As needed throughout the shift
- After every rainstorm or other hazard increasing occurrence
- Written documentation is required for each daily inspection and copy to be kept by the work crew.

These inspections are only required when employee exposure can be reasonably anticipated.



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Section 5: Trench Box Rental

Emergency Rental

In the event that a trench box is needed at short notice (less than 3 to 5 business days), a trench box can be rented from any local vendor as long as the total cost of the rental is \$2,500 or less. The following vendors carry various sizes of trench boxes on hand:

- MacAllister
- Sunbelt Rental
- United Rental

Planned Rental

If a planned work activity taking place (3-5 business days out) requires the use of a trench box or other shoring method that must be obtained through a rental company, Contact Danielle Buckel Procurement Program Director at 317-232-5401.

INDOT Equipment

Currently INDOT owns 1 trench box that is located in Fort Wayne.

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Facilities, Laboratories, and Housekeeping

Section 1: Facilities

The following procedures need to be adhered to:

- Employees using mail carts, furniture dollies, hand carts or building service cleaning carts should not leave them unattended in passageways. When it is necessary to park them in the halls, they will be parked close to the wall, but never close to a doorway or hall intersection.
- Employees shall report any broken, cracked or humped tile on floors or turned up corners on rugs, which constitute a hazard. The report should be made to the person in charge of building maintenance or their supervisors.
- Employees should be familiar with the location of first aid supplies and emergency alarm stations. It is recommended that employees know the locations of fire extinguishers and be instructed in their use.
- Approach and open closed doors with caution to avoid having the opening door strike someone. Keep to the right in corridors and at corners.
- Use the handrail when using stairs. Keep stairways clean and clear.

Section 2: Office Machines, Furniture and Equipment

Employees shall not operate a machine until they have been thoroughly trained to operate it safely. All machine guards must be kept in place and employees must follow the safety instructions for the machine being operated:

- Read instructions carefully before operating unfamiliar equipment.
- Always check machinery for frayed or broken electrical cords before using the equipment.
- If machinery sends off sparks, strong odor, smoke or feels tingly to the touch, immediately de-energize the equipment and report the situation to your supervisor. Be sure to post a sign warning others not to use the machine under any circumstances.
- Don't overload the electrical outlets in your office. Never break off the third prong on a plug so that it will fit into a two-prong receptacle.
- Disconnect electrical equipment before repair or maintenance. Electrical machines shall be shut off and the electrical circuit disconnected before attempting to adjust or clean the machine. Only qualified personnel will make the adjustments.
- File drawers will not be left open while unattended. The heaviest drawers will be at the bottom to avoid tipping the files. Employees should avoid opening more than one file drawer at a time. Always use the handle when closing file drawers.
- Telephone and power cords should not be left loose on the floor, or in any other position that could cause someone to trip. Arrange to have them shortened or anchored to a desk or wall.
- Broken veneer surface on desks and chairs will be repaired at once.
- Swivel chairs, file drawers and other unstable office equipment will not be used as a means of climbing or reaching. Ask for help, if it is necessary to move office equipment or furniture or when it is beyond your physical ability.
- When working with certain chemicals such as toner, ink from carbon paper or photocopier chemicals, take great care not to rub eyes. The use of gloves or other



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protective clothing may be necessary. Read all labels, the chemicals Safety Data Sheets and ask your supervisor about any precautions that you should take before using these chemicals.

- Avoid eyestrain from working at computers or working closely with various materials, by taking regular "eye breaks". This is done by looking up from your work and focusing on far away objects so that you can give your eyes a rest.

Section 3: Laboratories

- The department shall ensure that the hazards of all chemicals, equipment, procedures and testing methods are identified, and that information concerning these hazards is transmitted to laboratory employees through the Hazardous Communication Plan and Chemical Hygiene Plan. [1910.1450/1910.1200](#)
- The Hazardous Communication Plan provides information and instructions which will prevent chemical overexposure and, therefore, protect employees from adverse effects of hazardous chemicals.
- Avoid working alone in the building. Do not work alone if the procedures or chemicals have been designated as hazardous.
- Adequate ventilation, either natural or forced, will be provided in areas where volatile or toxic gases exist. Keep hazardous gases and vapors confined inside hoods.
- Keep adequate protection between you and any apparatus in which there is a chance of a flash or explosion.
- Stand to one side when opening doors of ovens containing explosive or highly flammable materials.
- When Bunsen burners or electric heaters are used, tables will be covered with nonflammable tops.
- Where strong acid is used, tables will be covered with an acid-resistant coating. Rubber gloves must be used.
- When nuclear gages are stored or used in laboratories they shall be used in accordance with the U.S. Nuclear Regulatory Commission regulations.
- When handling liquid chemicals, an eyewash station must be available for an employee's use within the room. [1910.151 \(C\)](#)
- No one should have to travel more than ten (10) seconds to a station. For corrosive liquids, an eyewash station and shower are required.
- A 15-minute supply of water is required for eyewash stations. When an eyewash station or eyewash/shower is required and running water is available in the building, the eyewash station or eyewash/shower must be permanently plumbed and connected to the running water.

Section 4: Housekeeping

Good housekeeping is one of the most important factors in enhancing safety, efficiency and fire protection. Good housekeeping guidelines include the following: [1910.141](#)

- Walkways and working areas should be kept clean, dry and unobstructed.
- All spills should be cleaned up immediately.
- Aisles and exits should be free of unnecessary tools, parts and equipment.
- Extension cords and hoses (air, water, etc.) should be stored properly, when not in use.
- Materials and supplies should be stacked properly and only to a height that is stable.



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- Stored items should not be stored so they overhang or protrude into work areas or aisles.
- In storage areas, items should not block heaters, exits, or fire extinguishers.
- Trash containers shall be labeled, emptied regularly, and not allowed to overflow.
- Oily rags must be kept in a labeled, covered, metal container to prevent fire hazards.
- Hand tools and other equipment should be stored so they will not fall or protrude into aisles or work areas.
- All containers shall be clearly labeled as to their contents and covered.
- All fire extinguishers, first aid kits, spill kits, breaker boxes, eye wash stations, emergency showers, and other safety related items must not be blocked or obscured and shall be clearly identified.

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Fall Protection

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Fall Protection

Section 1: General

INDOT shall provide and ensure that fall protection systems are available to all employees requiring protection from falls.

Training shall be conducted by a competent person for any employee who might be exposed to fall hazards. 1926.503(a)(1)

All working/walking surfaces shall have the strength and structural integrity to safely support INDOT employees.

Section 2: Specific Requirements

Employees shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall protection systems when the work is at least six (6) feet above the adjacent level or less than six (6) feet above dangerous equipment during construction activities. 1926.501(b)(1)

Fall protection shall be used when working four (4) feet above a lower level in all maintenance activities. 1910.23(a)(7)

At a minimum, these systems should be used when working in the following situations:

- Unprotected sides and edges
- Leading edges
- Hoist areas
- Holes
- Ramps, runways, and other walkways
- Excavations
- Roofing work on low-slope roofs and steep roofs
- Pre-cast concrete erection
- Building construction
- Wall openings
- Walking/working surfaces not otherwise addressed
- Work in Confined Spaces when necessary

Section 3: Training Requirements

INDOT shall provide a training program for each affected employee. Each employee shall be trained in the following areas:

- The nature of fall hazards in the work area.
- The correct procedures for erecting, maintaining, disassembling and inspecting the fall protection systems to be used.
- The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones and other protection to be used.
- The role of each employee in the safety monitoring system when this system is used.
- The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs.



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- The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection.
- The role of employees in fall protection plans.

An employee shall be retrained when there is reason to believe that the employee does not have the understanding and skills required.

Verification of training shall be through a written and/or electronic certification record. It shall contain the identity of the employee trained, date of training, and the signature of the trainer.

Section 4: Fall Protection Systems

Fall Protection Systems shall be provided in accordance with the requirements of the OSHA Fall Protection Standards. Fall Protection Systems are as follows:

Guardrail Systems

Guardrail systems are barriers that are erected to prevent employees from falling to lower levels. The requirements for using guardrail systems are as follows:

- The height of the top rail must be 42 inches above the walking/working level. [1910.23\(e\)\(1\)](#), [1926.502\(b\)\(1\)](#)
- When there is no wall or parapet wall at least twenty-one (21) inches high, mid-rails, screens, mesh, or an equivalent material must be installed between the top edge of the guardrail system and the working surface. [1910.23\(e\)\(1\)](#), [1926.502\(b\)\(2\)](#)
- Guardrails must, without failure, withstand a two hundred (200) pound force applied within two (2) inches of the top edge in an outward or downward direction, at any point along the top edge. [1910.23\(e\)\(3\)\(v\)\(c\)](#), [1926.502\(b\)\(3\)](#)
- Guardrails may be constructed of wood, pipe, roping, or wire.
- A chain, gate or removable guardrail section shall be placed around hoist areas to keep employees out when the area is not in use. [1926.502\(b\)\(10\)](#)
- Guardrails shall be used on the unprotected sides or edges of holes. [1926.501\(b\)\(4\)\(i\)](#)
- Guardrails shall be erected along each unprotected side or edge of a ramp or runway. [1910.23\(c\)\(2\)](#)
- A guardrail system shall be inspected as often as needed to ensure that the system meets all strength requirements.

Personal Fall Arrest Systems

Personal fall arrest systems shall be used for the following activities:

- Bucket and other platform lift operations
- Roofing operations
- Building construction
- Bridge construction and high steel
- Climbing and working on towers, utility poles and similar structures
- Working in confined spaces such as tanks, boilers, manholes, and other enclosed spaces that may have a hazardous atmosphere.

A properly worn harness will help prevent serious injury from the forces exerted on the body when stopping a fall. Harnesses shall be constructed out of nylon or polyester webbing.



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A lanyard is a flexible line of rope, wire rope or strap which generally has a connector at each end for connecting the harness to a deceleration device, lifeline or anchorage. All lanyards shall be used with a deceleration device built in (Shock Absorber). Lanyards must have a minimum breaking strength of five thousand (5,000) pounds.

A Horizontal lifeline is a rope or wire rope suitable for one or more person(s) connected to an anchorage to which a lanyard is attached. If more than 2 people are connected to the horizontal lifeline, stanchions shall be properly installed.

A Personal Fall Arrest System Shall:

- Limit the maximum arresting force on an employee to one thousand eight hundred (1,800) lbs when using a full body harness. 1926.502(d)(16)(ii)
- Be rigged so that the employee cannot free fall more than six (6) feet, cannot come in contact with a lower level, and is brought to a complete stop with a minimum deceleration distance of three and one-half (3 1/2) feet. 1926.502(d)(16)(iii), 1926.502(d)(16)(iv)
- Withstand two (2) times the potential impact of a worker free-falling six (6) feet or the free-fall distance allowed by the system, whichever is less. 1926.502(d)(16)(v)
- Be removed from service if used to prevent a fall. 1926.502(d)(19)
- Be inspected before each use or if subject to impact. 1926.502(d)(21)
- Not be attached to guardrail systems or hoists. 1926.502(d)(23)
- Be rigged so that an employee can only travel to the edge of the working surface when in use at a hoist area. 1926.502(d)(24)

Note: Standard personal fall arrest systems are not designed to support an employee having a combined tool and body weight of 310 lbs or more. Capital Safety DBI Sala Harnesses are rated to 420 lbs.

Positioning Device Systems

A positioning device is similar to a personal fall arrest system and uses some of the same components. The difference is that a fall arrest system is designed to stop a fall, while a positioning device is used to hold you in position so that you cannot fall while you are working.

Requirements for using a positioning device system are as follows:

- Full body harnesses are to be used as a positioning device.
- A positioning device system must be rigged so that a worker cannot free fall more than two (2) feet. 1926.502(e)(1)
- Anchorages must be able to support two (2) times the potential impact of an employee's fall or at least shall be 5,000 lbs. 1926.502(e)(2)
- Connectors shall be drop forged, pressed, formed steel, or a comparable material and corrosion-resistant with smooth edges to prevent damage to other parts of the system. 1926.502(e)(3)
- Connecting assemblies must have a minimum tensile strength of 5,000 pounds. (1926.502(e)(5))
- D-rings and snap hooks must be tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or changing shape. 1926.502(e)(6)
- Snap hooks must be double action self-closing/locking type or compatible in size to other pieces they connect in order to prevent unintentional opening. (After January 1, 1998



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only locking-type snap hooks can be used.) Gate shall have a breaking strength of at least three thousand six hundred (3,600) lbs. 1926.502(e)(7)

- Full body harnesses are to be used as a positioning device system only and not to hoist materials. 1926.502(e)(10)
- A positioning device system must be inspected before each use for wear, damage or deterioration and defective parts removed from use. 1926.502(e)(9)

Covers

Covers are used to prevent employees from falling through holes in floors, roofs, or other working surfaces.

Requirements for using covers are as follows:

- Roadway covers must support, without failure, at least two (2) times the maximum axle load of the largest vehicle that could cross the cover. 1926.502(i)(1)
- Other covers must support, without failure, at least two (2) times the weight of workers, equipment and materials that could be placed on the cover at any given time. 1926.502(i)(2)
- All covers must be secured so wind, equipment or workers cannot displace them. 1926.502(i)(3)
- All covers (other than cast iron manhole covers or steel grates) must be color coded or marked with the word "HOLE" or "COVER". 1926.502(i)(4)

Protection from Falling Objects

Protection from falling objects lists the requirements for toeboards, guardrails and canopies that are used to protect employees below from being struck by falling objects. Requirements for protection from falling objects are as follows:

Toe boards must be:

- Placed on the edge of the working surface (where workers, vehicles or equipment pass below) to catch tools or materials that may be dropped. 1926.502(j)(1)
- At least three and one-half (3 1/2) inches high. 1926.502(j)(3)
- Placed no more than one-fourth (1/4) of an inch above the working surface. 1926.502(j)(3)
- Able to withstand a fifty (50) pound force from a downward or outward direction. 1926.502(j)(2)

If tools or materials are piled higher than the toe board, paneling or screening shall be added from the toe board to the middle or top guardrail, whichever is best to protect the employees below. 1926.502(j)(4)

Guardrail systems used as a protection from falling objects shall have openings small enough to prevent tools or materials from passing through. 1926.502(j)(5)

Section 5: Care and Inspection

Care of Equipment

- Keep equipment in the best condition possible.
- Do not use equipment for hoisting materials or for any other purpose except fall protection.
- Clean webbing and fiber rope by washing with a mild soap and water.
 - Do not use solvents, bleach, or strong detergents.



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- Let equipment air dry completely before using, but do not force dry, and do not hang it in direct sunlight.

Inspection

- All fall protection equipment shall be formally inspected by an authorized person at a minimum of once a year. The results of the inspection shall be documented and kept on file.
- Employees are responsible for inspecting personal fall protection equipment every time they use it.
- If equipment shows any signs of wear or deterioration, tag it out of service and get a replacement.
- Webbing shall have no broken threads or stitches; brownish, hard shiny spots; mildew or accumulated dirt or grease.
- Fiber rope shall have no knots, frayed areas or broken fibers, loss of diameter or accumulated dirt or grease.
- Wire rope shall have no broken wires, kinks, flattened shiny areas, loss of diameter, or accumulated dirt or grease.
- Check all hardware, including thimbles on rope, grommets, D-rings, snap-hooks and buckles to make sure they are not bent, cracked, corroded, or obviously worn.

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Fire Protection, Prevention, and Extinguishers

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Fire Protection, Prevention, and Extinguishers

Section 1: General

All INDOT buildings and required vehicles will have adequate fire protection equipment. All personnel will comply with building evacuation procedures. Emergency evacuation plans shall be posted in all INDOT facilities. 1910.39

INDOT will provide training for designated fire extinguisher users and inspectors. Safety personnel shall be responsible for implementing and training of the fire extinguisher program. 1910.157(e)

An adequate number of fire extinguishers of the correct type and size based on the hazards in the work place must be provided for all work areas. 1910157(d)(5)

Fire extinguishers shall not be blocked or obscured from view. Materials shall not be stored in front of or on fire extinguishers. 1910.157(c)(1)

Section 2: Buildings

All areas shall be equipped with an adequate amount of fire extinguishers. Fire extinguishers shall be at least ten (10) lbs. and shall be mounted so that the travel distance to the extinguisher does not exceed fifty (50) feet. Extinguishers shall be mounted and carefully located so as to be accessible in the presence of a fire, without subjecting the employees to possible injury. 1910.157(c)

Extinguishers will be clearly identified with a sign marking its location and shall be securely mounted on a wall bracket. The top of the extinguisher shall not be more than five (5) feet from the floor. 1910.157(c)(2)

Section 3: Vehicles and Equipment

All vehicles and equipment used to transport flammable and hazardous materials will be equipped with at least one ten (10) pound extinguisher, rated 10 B:C or higher.

This extinguisher is required on, but not limited to, the following vehicles and equipment:

- Oil distributor trucks
- Oil distributor trailers
- Tar kettles
- Any equipment required by manufacturer operations manual.

One five (5) pound extinguisher rated 10 B:C or higher shall be on dump trucks and snow removal vehicles.

Extinguishers will be securely mounted in a bracket on or inside the vehicle/equipment. 1910.106(f)(ix)

Section 4: Inspection and Maintenance

The best time to stop a fire is before it starts. Even though buildings should be properly designed and constructed with fire safety features, periodic inspections are required. Supervisors will include periodic self-inspections in fire safety program:



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- Extinguishers will be inspected monthly to ensure that they are in their designated places, that they have not been activated or tampered with, and to detect any obvious damage, corrosion or other impairments. An extinguisher showing defects will receive a complete maintenance check. 1910.157(c)(2)
- Extinguishers will be thoroughly examined annually and if necessary, recharged, repaired or replaced. 1910.157(f)
- Extinguishers removed for maintenance will be replaced by spare extinguishers during the period that they are gone. 1910.157(c)(4)
- Extinguishers will have a durable tag securely attached to show the inspection date and signature or initials of the person who performed this service. 1910.157(f)(16)
- Dry chemical extinguishers will be equipped with a pressure gauge or an indicator which is clearly visible without removing the extinguisher from the bracket. 1910.161

Section 5: Inspection Requirements

Trained personnel will perform monthly and annual fire extinguisher inspections for the facility, vehicles and equipment for which they are responsible.

Monthly inspections shall consist of the following:

- Proper location and accessibility
- Necessary labels and tags
- Operating instructions present on nameplate and legible
- General condition of cylinder or shell and hoses
- Seals and tamper indicators not broken or missing
- Handle assembly for damage (pin in place)
- Pressure gauge reading in operable range or position
- Hose assembly for leakage and tightness
- Date and initial

Annual inspections shall consist of the following:

- Proper location and accessibility
- Necessary labels and tags
- Operating instructions present on nameplate and legible
- General condition of cylinder or shell
- Seals and tamper indicators not broken or missing
- Handle assembly for damage (pin in place)
- Pressure gauge reading in operable range or position
- Hose assembly for leakage and tightness
- Displacement or reposition of dry powder
- Hydrostatic test date
- Remove outdated tags or labels
- Date and initial

Note: The fire extinguisher must be removed from service if any of the following are found 1910.157(g)(1-3):

- Any deficiency in mechanical parts
- Any deficiency in extinguishing agent



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- Any deficiency in expelling means
- Outdated if non-rechargeable (12 years)
- If questionable in any way
- Hydrostatic test is out of date

Section 6: Fire Extinguisher Classification

Fire extinguishers are classified to indicate their ability to handle specific classes and sizes of fires.

Labels on extinguishers indicate the class type and relative size of fire that they can be expected to handle.

Use the right extinguisher for the type of fire for which it is intended. The wrong extinguisher may spread the fire and/or be dangerous to the extinguisher operator. The four (4) types of fire extinguishers and their uses are as follows:

- Class A Extinguishers – Used for ordinary combustibles such as wood, paper, some plastics and textiles where a quenching-cooling effect is required. [1910.157\(d\)\(3\)](#)
- Class B Extinguishers – Used for flammable liquid and gas fires such as oil, gasoline, paint and grease. [1910.157\(d\)\(4\)](#)
- Class C Extinguishers – Used for fires involving electrical wiring and equipment. Class C fires are essentially either Class A or Class B, but also involve energized electrical wiring and equipment; therefore, the coverage of the extinguisher must be chosen for the burning fuel. [1910.157\(d\)\(5\)](#)
- Class D Extinguishers – Used for fires in combustible metals such as magnesium, potassium, powdered aluminum, zinc, sodium, titanium, zirconium, and lithium. Persons working in areas where Class D fire hazards exist must be aware of the dangers in using Class A, B, or C extinguishers on a Class D fire, as well as the correct way to extinguish Class D fires. These units are not classified by a numerical system and are intended for a special hazard protection only. [1910.157\(d\)\(6\)](#)

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First Aid and Cardiopulmonary Resuscitation

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First Aid and Cardiopulmonary Resuscitation

Section 1: General

Effective first aid has saved many lives. By knowing the basic methods of emergency first aid, you may save a life. [1910.266](#), [1910.151](#), [1926.50](#)

Certified personnel must have first-aid and a CPR training program for all employees engaged in logging activities.

Section 2: What to Do in an Emergency

If you are present or arrive early at the scene of a serious accident, the following is suggested:

- Remain calm at all times
- Encourage others to be calm
- Summon help
- Call 911

Although all emergency situations are not the same, there are basic procedures that will apply:

- Do not move a victim unless absolutely necessary. Moving the victim could cause further injury; however, if the victim's position poses a life threatening situation, they should be moved to safety.
- Maintain an open airway and restore breathing if necessary.
- Control bleeding.
- Treat victim for shock.
- If the victim is conscious, reassure them that aid is on the way. Information regarding the victim's condition should be left to qualified medical personnel.
- Make the victim as comfortable as possible while waiting for aid.
- Remain at the scene until emergency help arrives.
- Discuss details of the occurrence only with police or other qualified authorities. Give only factual information related to the accident.

When you call, or when you send someone to call for emergency aid, remember to give as accurate a location as possible – highway number and reference post, number of persons injured, type of injuries, etc.

Section 3: First Aid and CPR Training

First aid and CPR training is provided to all employees. All field employees are required to take the provided First Aid and CPR training. Employees are not required to administer First aid and CPR; however, if they volunteer to administer it, it is protected by the Good Samaritan law.

Section 4: First Aid Kits

INDOT provides first aid supplies which are readily available to all employees. Managers shall be responsible for ensuring that first-aid kits are procured, inspected and maintained. First aid kits shall be placed in all INDOT facilities and vehicles. The size and the content of the kit shall be appropriate for the area.

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Flammable Gases and Liquids

Responsible Department: Statewide Safety

Last Updated: 2016

Flammable Gases and Liquids

Section 1: General

Flammable liquid means any liquid having a flashpoint at or below 199.4 °F (93 °C). Flammable liquids are divided into four (4) categories as follows: [1910.106\(a\)\(19\)](#)

- Category 1 shall include liquids having flashpoints below 73.4 °F (23 °C) and having a boiling point at or below 95 °F (35 °C). [1910.106\(a\)\(19\)\(i\)](#)
- Category 2 shall include liquids having flashpoints below 73.4 °F (23 °C) and having a boiling point above 95 °F (35 °C). [1910.106\(a\)\(19\)\(ii\)](#)
- Category 3 shall include liquids having flashpoints at or above 73.4 °F (23 °C) and at or below 140 °F (60 °C). When a Category 3 liquid with a flashpoint at or above 100 °F (37.8°C) is heated for use to within 30 °F (16.7 °C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 3 liquid with a flashpoint below 100 °F (37.8 °C). [1910.106\(a\)\(19\)\(iii\)](#)
- Category 4 shall include liquids having flashpoints above 140 °F (60 °C) and at or below 199.4 °F (93 °C). When a Category 4 flammable liquid is heated for use to within 30 °F (16.7 °C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 3 liquid with a flashpoint at or above 100 °F (37.8 °C). [1910.106\(a\)\(19\)\(iv\)](#)

When liquid with a flashpoint greater than 199.4 °F (93 °C) is heated for use to within 30 °F (16.7 °C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 4 flammable liquid. [1910.106\(a\)\(19\)\(v\)](#)

Safety Data Sheets (SDS) shall be on site and available for all hazardous materials.

Many adhesives, accelerants and solvents pose hazards. All liquids should be considered flammable unless their label clearly indicates otherwise. Conditions can change rapidly that extreme care is necessary whenever flammable liquids or gases are being used.

When handling flammable liquids and gases the following shall apply:

- Flammable liquid and gas storage areas will be located where public fire protection has access to the site.
- The telephone number of the local fire department and other emergency numbers will be posted at all telephones.
- Storage areas for flammable liquids or gases shall be located away from equipment, materials, or other structures that could become involved if a fire breaks out in the storage area.
- Structures to be used for the storage of flammable liquids or gases shall be fire-resistant and located away from burning, welding, and other operations involving the generation of heat.
- Structures to be used for the storage of flammable liquids or gases shall be well ventilated.
- In every storage room, there shall be one clear aisle at least three (3) feet wide.
- Containers holding more than thirty (30) gallons shall not be stacked one upon the other.
- Motors, switches and other electrical equipment (including light fixtures and bulbs) within such storage areas will be approved for these areas.



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- Suitable fire extinguishers will be located within the area and adjacent to it. The outside extinguishers will be sufficiently distant to assure accessibility if a fire is to break out, but near enough to be useful.
- Containers from which flammable liquids are dispensed shall be grounded.
- Flammable liquids and gases will be stored in containers providing positive identification of the contents. If there is any question as to the contents of a container, it should not be used until it has been positively identified and labeled.
- The storage of flammable liquids and gases should be kept to the minimum needed. When there are more than twenty-five (25) gallons of flammable or combustible liquids in any one building, it will be stored in approved nonflammable storage cabinets that are labeled "Flammable Liquids".
- Not more than sixty (60) gallons of Class I and Class II liquids, or more than one hundred twenty (120) gallons of Class II liquids, may be stored in storage cabinets.
- Personnel having access to storage areas shall be trained in the characteristics of such substances, the exposures such characteristics create and the precautions that must be taken to avoid accidents.
- Flammable liquids shall be stored in tanks, closed containers or approved safety cans.
- Containers used for storing and dispensing flammable liquids shall be approved for such use. Flammable liquids shall not be dispensed into containers that are not approved.
- If a container has once been used for one substance, it should not be used for another until it has been thoroughly purged. Pouring oil into containers that previously held gasoline has resulted in many fires.
- Containers, nozzles, and related dispensing equipment should be identified as to use, be of an approved type, stored to avoid damage, and inspected regularly.
- The distance between any two (2) flammable liquid storage tanks shall not be less than three (3) feet.
- All above-ground storage tanks shall have a pressure relief venting device that will relieve excessive internal pressure caused by exposure to fires.
- Pumps, containers and other dispensing equipment shall be kept clean and free of contaminants.
- Tools used in storage and dispensing equipment shall be kept clean and free of contaminants.
- The transfer or mixing of flammable liquids will only be done in well-ventilated areas. Employees engaged in the handling of flammable liquids must be made aware of the importance of insisting that no sources of ignition be brought within the designated area. Damaged or faulty dispensing equipment or containers will be replaced or repaired immediately.
- Materials that will react with water shall not be stored in the same room with flammable or combustible liquids.

Section 2: Use of Flammable Liquids and Gases

Use only approved solvents for cleaning operations. Never use gasoline. Never use flammable liquids in the presence of welding, burning or other operations involving open flames, sparks, or the generation of heat. Never use containers that do not positively identify the contents.

All heat producing equipment will be cleaned, inspected and kept in good working condition to prevent accidental ignition.



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Dispose of wiping rags, etc. in approved containers. Containers of flammable liquids should be returned to proper storage areas at the close of each day.

Many petroleum products are toxic and flammable. Avoid any prolonged contact with the skin. Most flammable gases and liquids are asphyxiates.

Do not use solvents or gasoline to clean your skin. Use a cleaner that does not irritate skin and plenty of soap and water.

Section 3: If a Fire Should Occur

INDOT employees are not required to put out fires.

Notify others of a fire (pull fire alarm), go to "head count area", and then call 911.

INDOT employees may "Voluntarily Use," fire extinguisher and or fire hose and equipment, for small incipient stage fire if employee has been properly trained on how to use fire equipment. If the fire has grown out of control (past the incipient stage), instead go to head count area and allow emergency personnel to respond. Employees are not permitted to reenter the area until cleared by emergency personnel.

Section 4: Purging Tanks and Containers

Tanks or containers that have contained flammable liquids or gases shall be thoroughly purged before any repair work is attempted. The proper purging of tanks that contained flammable liquids or gases requires adequate facilities and trained personnel are employed.

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Hazard Communication

Responsible Department: Statewide Safety

Last Updated: 2016

Hazard Communication

Section 1: General

It is the policy of INDOT to ensure that the hazards of all chemicals found in the workplace are identified and that information concerning these hazards is communicated to all INDOT employees and contractors. This policy is implemented through the Hazard Communication Program. All INDOT employees shall be trained on operations where exposure to the hazards of chemicals may occur and how employees can access this program, as well as labels and Safety Data Sheets (SDS). 1910.1200

Safety Personnel and/or Immediate Supervisor will be responsible for employee information and training. New employees will be trained during New Employee Orientation on the Hazard Communication Program.

Section 2: List of Chemicals by Work Areas

A list of hazardous chemicals utilized at each INDOT facility will be the same as that on the container label and the Safety Data Sheet for that chemical. This list shall be maintained with Safety Data Sheets and made available for review at all times. 1910.1200 (e) (1) (i)

Section 3: List of Consumer Products

Certain chemicals and chemical products available through retail outlets may be used at INDOT facilities, which present no greater duration or frequency of exposure than that resulting from normal consumer use; these products are defined as "consumer products". Supervisor shall determine which chemicals and chemical products used in its facilities fit the description of consumer products. The consumer product list shall be maintained and located with the list of Safety Data Sheets for each location.

Section 4: Safety Data Sheets (SDS)

Safety Personnel will be responsible for establishing and monitoring the SDS program. Copies of SDS for the hazards of all chemicals to which employees are exposed or are potentially exposed shall be kept in designated areas. Employees shall have access to SDS at all designated areas.

The worksite supervisor will be responsible for reviewing the SDS received for safety and health implications and initiating any needed changes in work place practices.

INDOT shall rely on the chemical manufacturers from whom it purchases chemical products to evaluate the hazards of the chemicals utilized at INDOT facilities. Safety Data Sheets, for chemicals used in the work place, are expected to be provided by all chemical manufacturers and/or distributors.

SDS for each hazardous chemical utilized at all INDOT facilities shall be maintained in the work area clearly marked and made readily available to all employees.

SDS shall be maintained on file at each facility for 30 years. 1910.1200 (g)



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Section 5: Labeling Procedures and Other Forms of Warnings

Supervisors shall ensure that all containers of chemicals received for use and on the job site are properly labeled, including a product identifier, pictogram, hazard statement, signal word, precautionary statements and the suppliers contact information. (Name-address-phone number).

Supervisors in each work location or INDOT facility shall ensure that all secondary containers are labeled with the original suppliers label or with an alternative workplace label.

All containers of hazardous materials received at INDOT facilities must be accompanied by a manufacturer's label, including a product identifier, pictogram, hazard statement, signal word, precautionary statements, and manufacturer contact information. These labels will vary by manufacturer. Labels must contain information related to the critical components of hazard communication in terms of identity, health hazards, flammability ratings, reactivity, physical hazards, and personal protective equipment recommendations. Manufacturer's labels meeting these requirements are sufficient and are permissible for containers in INDOT facilities.

When materials are transferred from the (original) containers, or the manufacturer's label becomes defaced or mutilated, the following shall apply.

- All containers of hazardous materials at INDOT facilities that are originated through transfer from the original container to a secondary container, or containers in which the manufacturer's label becomes destroyed shall have alternatives such as third party systems e.g., (HMIS). GHS labeling shall be utilized as phase in dates require, in addition to other required information. Employees shall have complete access to hazard information.
- INDOT will rely upon the manufacturers labeling system as the primary labeling system.
- Upon receipt of the SDS for a chemical purchased from a retail supplier, the label information shall be compared to the information on the SDS. Inquiry shall be made by contacting the manufacturer and or distributor regarding any discrepancies and a record of all telephone and or e-mail inquiries shall be maintained.
- No INDOT employee shall purchase chemical products for use at a facility from local wholesale or retail establishments, unless the immediate supervisor has approved the purchase in advance. Supervisor shall then inform the affected employees of the new hazardous chemical and review SDS and hazards with them.
- Labels shall be checked on a regular basis and any that are damaged or missing shall be replaced. 1910.1200 (f)

Section 6: Non-Routine Tasks

A non-routine task is one for which employees have not received special training. In general, non-routine tasks are carried out on an infrequent basis. Examples include: mixing or applying hazardous chemicals, cleaning equipment which contained chemicals, etc.

When a non-routine task is to be performed, all information shall be conveyed to the employees regarding the hazards of the chemicals he or she may encounter during such activity. This information shall include specific chemical hazards, personal protective equipment, safe work practices and steps INDOT has taken to reduce the hazards. 1910.1200 (e) (1) (ii)



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Section 7: Pipes and Piping Systems

The chemical contents (including petroleum) of piping systems in each work area shall be identified and information about the hazards of such chemicals shall be provided to employees.

Section 8: Hazard Communication Information

A copy of the INDOT written Hazard Communication Program shall be reviewed with all new employees and current employees.

A copy of the INDOT written Hazard Communication Program shall be located in each work area, readily accessible to employees who wish to read or review the program. 1910.1200 (h)

Section 9: Hazard Communication and Training Program

Hazard communication training shall be provided to all new employees during new employee orientation and additional training as needed. Training shall be provided by immediate supervisor for all affected employees whenever a new chemical hazard is introduced to their work area and whenever the employee is transferred to a different work area where new chemical hazards are present. 1910.1200 (h)

Section 10: Procedures for Informing Contractor Workplaces of Chemical Hazards

The contractor shall provide the INDOT Work Site Supervisor with the SDS information for the hazards of all chemicals being brought into the work area(s). Also, INDOT Work Site Supervisor shall provide the contractor SDS for the hazards of all chemicals that may be encountered by the contractor and contractor employees. 1910.1200 (e) (2)

Section 11: Procedures for Incidental Spills

Incidental spills shall be referred to as the release of a hazardous material on INDOT properties and INDOT knows the hazardous contents of the material and will have the means to safely clean the spill up.

Should an incidental spill occur, the SDS shall be consulted to determine the safest method to use for cleanup. Notify affected employees in the work area of the spill and supervisor if necessary, if possible use spill kit to clean it up immediately. If more than an incidental spill, contact supervisor, safety personnel, and environmental personnel for appropriate cleanup.

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Hazardous Material Accidents/Incidents

Responsible Department: Statewide Safety

Last Updated: 2016

Hazardous Material Accidents/Incidents

Section 1: Policy

The Indiana Department of Transportation (INDOT) will cooperate with other local, state, and federal governmental agencies and private emergency services organizations in accidents/incidents involving hazardous materials on the highways to minimize the loss of life, property, and environmental damage and to ensure that highways are safely opened to public traffic following the clean-up of the incident site.

Section 2: Procedure

When INDOT employees approach the upwind direction of the scene of an accident/incident involving (or suspected of involving) hazardous materials:

- Stop at least 500 feet from the accident scene or, if closer when the accident is observed, retreat immediately to that distance and set up a roadblock to stop traffic.
- Using any means available, set up a roadblock on the downwind site to stop traffic at least one-quarter mile from the scene.

When INDOT employees approach from the downwind direction the scene of an accident/incident involving (or suspected of involving) hazardous materials:

- Stop at least one-quarter mile from the accident scene or, if closer when the accident is observed, retreat immediately to that distance and set up a roadblock to stop traffic.
- Using any means available, set up a roadblock on the upwind side to stop traffic at least 500 feet from the scene.

The "upwind" or downwind" crew which arrives first at the scene shall contact the next approaching crew and direct them to the opposite end of the accident. They both shall then size-up the scene to obtain as much of the following information as possible.

- Exact location
- Arrival time
- Identification of carrier and its telephone number.
- Shape of container
- Placards/labels/material identification (exact spelling)
- Physical hazards (fire, spill or leaks)
- Wind direction and other pertinent weather conditions
- What is at risk? People, property, or environment.
- Injuries
- Drains, sewers, or surface waters nearby

The roadblock crew shall transmit its recorded observations to the nearest INDOT District or Subdistrict facility.

- The District or Subdistrict facility receiving the report shall record the information and read it back to the roadblock crew for confirmation.
- The identification number shall be repeated and the name of the hazardous material spelled by both the roadblock crew member and the person at the District or Subdistrict



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receiving the report until confirmation of the number and the name of the hazardous material is confirmed as accurate.

The District or Subdistrict person receiving the report from the roadblock crew at the scene shall contact the following agencies by radio or telephone in the order they are listed below to report the information:

1. Indiana State Police (Motor Carrier Division) Nearest Post
2. Indiana Department of Environmental Management Indianapolis 317-233-7745 OR 888-233-7745
3. County Sheriff's Office
4. Local Fire Department
5. District Safety Coordinator
6. District Environmental Coordinator

Roadblock crews will remain at their locations near the scene to await the arrival of local and/or state emergency response personnel.

When emergency response personnel arrive at the scene, INDOT employees shall, from their roadblock positions, assist by performing only the following functions:

- Continue the roadblocks in both directions or, if requested by emergency response personnel, partially remove the roadblock to permit traffic flow.

It is the duty of the Incident Commander to determine a safe perimeter around the site as well as determine when it is safe to reopen the roadway. In no case will INDOT employees move from their roadblock position to locations closer to the accident scene until the Incident Commander deems the area safe.

When an INDOT supervisor arrives at the scene they will assume supervisory authority for roadblock crew members and shall be responsible for discussions with the incident commander of the emergency response personnel. An incident commander is the person, normally the fire chief of the impacted area, who is in charge of the emergency response site. The INDOT supervisor is authorized to direct roadblock crew members to perform only the following function once the incident commander has established that the accident scene is safe for a closer approach:

- Transporting sand or other material to the scene and dumping or distributing sand or other material by truck or by hand, as long as no INDOT equipment or employee goes beyond the safety perimeter. Sand dikes shall be constructed at a safe distance from the area covered by or saturated with the spilled material.

No other functions are permitted to be performed by INDOT employees. **At no time shall any INDOT personnel go beyond the safety perimeter established by the incident commander.** INDOT employees or equipment shall not be used to:

- Remove sand or other materials contaminated or assumed to be contaminated by the spilled hazardous material from the scene.
- Remove drums, bags, boxes, or any other containers – with contents or empty – from the scene.
- Remove accident victims – injured or not – from the scene.
- Perform site clean-up of spilled materials or equipment used at the scene.



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- No INDOT facility or highway rights-of-way shall be used for the temporary storage of containers or piles of hazardous materials or contaminated diking materials or soil from rights-of-way collected from an accident scene clean-up or containers or materials abandoned in highway right-of-way or on other State of Indiana property.

If it is necessary to close the roadway, the party carrying the hazardous materials must act within a reasonable timeframe to initiate clean-up operations. If they cannot or fail to make such arrangements, the State of Indiana will call in a clean-up contractor to the scene. The State Police, Division of Motor Carriers, acting as this agent for the state, will be responsible for making this call after consulting with INDOT, IDEM, and the local Fire Department.

When material or containers are abandoned on highway right-of-way, the above procedure is to be followed where practical.

INDOT will request direction from the Indiana Department of Environmental Management (IDEM) for the clean-up and containment operations. INDOT shall coordinate with IDEM to ensure that the pavement, shoulders, drainage, traffic control devices, etc. are restored to acceptable INDOT standards. IDEM will provide assistance either through telephone communication or by on-scene assistance.

A record shall be made of all expenses incurred (wages, materials, vehicles, equipment) in these operations so that the appropriate company or individual will be billed. The district will prepare a memorandum to the Accounting and Control Division showing all expenses incurred and the name and address of the company or individual to be billed.

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Lockout/Tagout

Responsible Department: Statewide Safety

Last Updated: 2016

Lockout/Tagout

Definitions

Affected Employee

An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout/tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed. This employee has the authority to “Down” a piece of equipment which then cannot return to operation until an Authorized Employee inspects that piece of equipment.

Authorized Employee

An employee who locks or implements a lockout/tagout system procedure, on machines or equipment, to perform the servicing or maintenance on that machine or equipment.

Capable of Being Locked Out

An energy isolating device will be considered to be capable of being locked out, either if it is designed with a hasp, or other attachment, or integral part to which, or through which, a lock can be affixed, or if it has a locking mechanism built into it. Other energy isolating devices will also be considered to be capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.

Energized

Connected to an energy source or containing residual or stored energy.

Energy Isolating Devices

A mechanical device that physically prevents the transmission or release of energy, including, but not limited to the following: a manually operated electrical circuit breaker; a disconnect switch, a manually operated switch, by which the conductor of a circuit can be disconnected from all ungrounded supply conductors, and, in addition, no pole can be operated independently; a slide gate; a slip blind; a line valve; a block; and any similar device used to block or isolate energy. The term does not include a push button, selector switch and other control circuit type devices.

Energy Sources

Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal or other energy.

Hot Tap

A procedure used in the repair, maintenance, and service activities which includes welding on a piece of equipment (pipelines, vessels, or tanks) under pressure in order to install connections, or appurtenances. It is commonly used to replace or add sections of pipeline, without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.



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Lockout

The placement of lockout/tagout devices on an energy isolating device in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout/tagout device is removed.

Lockout Device

A device that utilizes a positive means such as a lock, either key or combination types, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment.

Normal Production Operations

The utilization of a machine or equipment to perform its intended production function.

Servicing and/or Maintenance

Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or un-jamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to unexpected energization or start-up of the equipment or release of hazardous energy.

Setting Up

Any work performed to prepare a machine or equipment to perform its normal production operations.

Tagout

The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device, and the equipment being controlled may not be operated until the tagout device is removed.

Tagout Device

A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device, in accordance with an established procedure to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Section 1: General

This standard covers the servicing and maintenance of machines and equipment in which the unexpected energization or startup of the machines or equipment, or release of stored energy, could harm employees. This standard establishes minimum performance requirements for the control of such hazardous energy. Every employee has the responsibility to identify inadequate equipment. It is the employee's responsibility to then notify an "Authorized Employee". 1910.147

Section 2: Energy Control Procedures

Procedures specified in this written program shall be used by employees to control potentially hazardous energy when engaged in the activities covered in these procedures. The procedures clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy and the means to enforce compliance, including but not limited to the following: 1910.147 (c) (1)



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- A specific statement of intended use of the procedure.
- Specific procedural steps for shutting down, isolating, blocking, and securing machines or equipment to control hazardous energy.
- Specific procedural steps for the placement, removal, and transfer of lockout or tagout devices and the responsibility for them.
- Specific requirements for testing machines or equipment to determine and verify the effectiveness of lockout devices, tagout devices and other energy control measures.
- Specific identifiable lockout or tagout devices shall indicate the identity of the employee who applied the devices.

Section 3: Periodic Inspections

Authorized personnel will conduct periodic inspections of energy control procedures at least annually to ensure that the procedures and the requirements of this policy are being followed. The inspections will be conducted by an authorized individual other than the one(s) utilizing the energy control procedures.

The periodic inspection shall be designed to correct any deviations or inadequacies observed. Where lockout is used for energy control, the periodic inspection shall include a review by authorized person.

Safety personnel will ensure that the periodic inspections have been performed and supervisors will keep records of each inspection. The records shall identify the machine or equipment on which the energy control procedure was utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

Section 4: Training and Communication

Employee Training

Safety personnel and supervisors will provide training to ensure that the purpose and function of the energy control program is understood by employees, and that the knowledge and skills required for the safe application, usage, and removal of energy control devices are understood by the employees. The training shall include the following:

- Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.
- Each affected employee shall be instructed in the purpose and use of the energy control procedure.
- All other employees whose work operations are, or may be, affected by this policy shall be instructed about the procedure and about the prohibition relating to attempts to restart or re-energize machines or equipment which are locked or tagged out.

Employee Re-training

Re-training shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment, or processes that present a new hazard, or when there is a change in the energy control procedures. Re-training shall also be conducted whenever a periodic inspection reveals, or whenever an authorized person has reason to believe, that there are deviations or inadequacies in the employee's knowledge or use of energy control procedures.



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Section 5: Notification of Employees

Supervisors will notify all affected employees of the application and removal of lockout/tagout devices. Notification shall be given before the controls are applied, and after they are removed from the machine or equipment.

Section 6: Application of Control

The established procedure for the application of energy control (implementation of lockout/tagout systems procedures) shall cover the following elements and procedures and shall be implemented in the following sequence:

Preparation of Shutdown

Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.

Machines or Equipment Shutdown

The machine or equipment shall be turned off or shut down using the procedures required by this policy. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of equipment de-energization.

Lockout/Tagout Device Application

Lockout/tagout devices shall be affixed to each energy isolating device by authorized employees. Lock devices shall be affixed in a manner that will hold the energy isolating devices in a "safe" or "off" position.

Section 7: Stored Energy

Following the application of lockout/tagout devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe. If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed or until the possibility of such accumulation no longer exists.

Section 8: Verification of Isolation

Prior to starting work on machines or equipment that have been locked out, the authorized employee shall verify that isolation and de-energization of the machine or equipment has been accomplished.

Section 9: Sequence of Lockout/Tagout

Each facility supervisor shall establish a program consisting of energy control procedures and employee training for each type of machinery or equipment. The following steps are a general guideline that is to be applied to lockout or tagout any piece of machinery or equipment:

- 1) Notify all "Affected Employees" that servicing or maintenance is required on a machine or equipment and that the machine or equipment must be shut down and locked out to perform the servicing or maintenance



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- 2) The "Authorized Employee" shall refer to the procedure to identify the type and magnitude of the energy that the machine or equipment utilizes, shall understand the hazards or the energy, and shall know the methods to control the energy.
- 3) If the machine or equipment is operating, shut it down by the normal stopping procedure (depress the stop button, open switch, close valves, etc.)
- 4) De-activate the energy isolating device(s) so that the machine or equipment is isolated from the energy source(s).
- 5) Lock out the energy isolating device(s) with the assigned individual lock(s).
- 6) Stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.
- 7) Ensure that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, then verify the isolation of the equipment by operating the push button or other normal operating control(s) or by testing to make certain the equipment will not operate.

Note: Return operating control(s) to neutral or "Off" position after verifying the isolation of the machine or equipment.

Section 10: Release from Lockout/Tagout

Before lockout or tagout devices are removed and energy is restored to the machine or equipment, procedures shall be implemented by the authorized employee(s) to ensure the following:

- The machine or equipment – The work area shall be inspected to ensure that nonessential items have been removed, and that machine or equipment components are operationally intact.
- Employees – The work area shall be checked to ensure that all employees have been safely positioned or removed. Before lockout or tagout devices are removed and before machines or equipment are energized, affected employees shall be notified that the lockout/tagout devices are being removed.
- Lockout/tagout devices removal – Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device.

Sequence for Restoring Equipment to Service

When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken:

- 1) Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.
- 2) Check the work area to ensure that all employees have been safely positioned or removed from the area.
- 3) Verify that the controls are in neutral.
- 4) Remove the lockout devices to reenergize the machine or equipment.

Note: The removal of some forms of blocking may require re-energization of the machine before safe removal.



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- 5) Notify "Affected Employees" that the servicing or maintenance is completed and the machine or equipment is ready for use.

Exceptions

When the employee who applied the lockout or tagout device is not available to remove it, that device may be removed under the direction of another authorized employee, provided the specific procedures and training for such removal have been developed, documented, and incorporated into the Energy Control Program. Each facility shall demonstrate that the specific procedure provides equivalent safety to the removal of the device by the authorized employee who applied it. The specific procedure shall include at least the following elements:

- Verification that the authorized employee who applied the device is not at the facility.
- Making all reasonable efforts to contact the authorized employee to inform him/her that their lockout/tagout device has been removed.
- Ensuring that the authorized employee has this knowledge before he/she resumes work at the plant.

Section 11: Additional Requirements: Testing or Positioning of Machines, Equipment or Components

In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device, and the machine or equipment energized to test or position the machine or equipment or component thereof, the following procedures shall be followed:

- Clear the machine or equipment of tools and materials.
- Remove employees from the machine or equipment area.
- Remove the lockout/tagout devices following INDOT policies and procedure.
- Energize and proceed with the testing or positioning.
- De-energize all systems and re-apply energy control measures.

Section 12: Outside Personnel (Multi-Employers)

Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this policy, an INDOT supervisor and the vendor shall inform each other of their respective lockout/tagout procedures.

The INDOT supervisor shall ensure that all employees understand and comply with restriction and prohibition of the energy control procedures.

The INDOT supervisor shall ensure that employees of outside contractors understand and comply with the INDOT energy control procedures.

Section 13: Group Lockout/Tagout Procedures

When servicing and/or maintenance is performed by a crew, team, department or other group they shall utilize a procedure that affords the employee a level of protection equivalent to those provided by the implementation of a personal lockout/tagout device.

Group lockout/tagout device(s) shall be used in accordance with the procedures required by INDOT policies including, but not necessarily limited to the following specific requirements:



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- Primary responsibility is vested in the authorized employee, for the set number of employees, working under the protection of a group lockout/tagout device.
- The authorized employee shall ascertain the exposure status of individual group members with regard to the lockout/tagout of the machine or equipment.
- When more than one crew, team, or department is involved assignment of overall job-associated lockout/tagout control responsibility will be made to an authorized employee designated to coordinate affected work force and ensure continuity of protection.

Section 14: Shift or Personnel Changes

Specific procedures shall be utilized during shift or personnel changes to ensure the continuity of lockout/tagout protection including provisions for the orderly transfer of lockout/tagout devices between off-going and on-coming employees to minimize exposure to hazards from the unexpected energization, start-up of the machine or equipment, or release of stored energy.

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Machine Guarding

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Machine Guarding

Section 1: General

Guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by: rotating parts, ingoing nip points, point of operation, flying debris, and sparks. Unguarded moving parts and or equipment, when in motion are potentially hazardous to employees. Rotating members, reciprocating arms, moving belts, meshing gears, cutting teeth, and parts that impact or shear are all examples of the types of action and motion requiring guards. They are not peculiar to any one machine, but are basic to the mechanical devices used for productive purposes. 1910.212 - 219

Any rotating object is dangerous. Even smooth, slowly rotating shafts, belts or pulleys can grip clothing, hair, jewelry and through mere contact, can force an arm, hand or your body into a dangerous position. Accidents due to contact with rotating objects are not frequent, but the severity of injury is usually high.

Do not wear loose clothing nor loose jewelry and long hair shall be pulled back or tucked up in hat or hair net when operating and or exposed to machinery and equipment with unguarded rotating parts such as but not limited to: drill press, lathes, etc.

Machine design should permit routine lubrication and adjustment without the removal of guards. But when guards must be removed and the machine serviced, the INDOT lockout/tagout procedures must be adhered to. No machine should be started and/or operated unless the guards are in place and in good condition.

Section 2: Training

Safety training is necessary for new operators and maintenance personnel when any new or altered safeguards are put into service, or when workers are assigned to a new machine or operation.

Thorough operator training should involve instruction and hands-on training in the following:

- A description and identification of the hazards associated with particular machines.
- The safeguards themselves – how they provide protection and the hazards for which they are intended.
- How to use the safeguards and why.
- How and under what circumstances safeguards can be removed and by whom (in most cases, repair or maintenance personnel only), and what to do (e.g., contact your supervisor and or safety department) if a safeguard is damaged, missing, or unable to provide adequate protection.
- Follow the manufacturer's recommendations (read and follow the operator's manual)

Section 3: Specific Requirements

Abrasive Wheels on Bench Grinders

Abrasive wheels shall be used only on machines provided with safety guards. The safety guard will cover the spindle end, not flange projections, and will be mounted to maintain proper alignment with the wheel. The strength of the fastening will exceed the strength of the guard. The exposed area of the grinding wheel, and sides for the safety guards will not exceed more



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than one-fourth (1/4) of the entire wheel. Work rests should be kept adjusted close to the wheel, with a maximum distance of one-eighth (1/8) of an inch. Tongue guards shall be adjusted close to the wheel, with a maximum distance of one-fourth (1/4) of an inch. [1910.215](#)

Circular Saws

Circular saws will be provided with a hood that covers the teeth of the saw at all times. The hood should adjust itself automatically to the thickness of, and remain in contact with, the material being cut. [1910.212](#), [1910.213](#)

Table Saws

Table saws shall be provided with a hood that covers the teeth of the saw at all times. The hood should adjust itself automatically to the thickness of, and remain in contact with, the material being cut. A spreader and anti-kickback device shall be provided. The exposed part of the saw underneath the table will be guarded. Push sticks shall be used when materials being cut are too small to be held safely by hand. [1910.212](#), [1910.213](#)

Radial Arm Saws

The upper hood shall completely enclose the upper portion of the blade, down to a point that will include the end of the saw. In addition to a hood enclosing the blade, an adjustable stop should be provided to prevent the forward travel of the blade beyond the position necessary to complete the cut. When used for ripping, a spreader and an anti-kickback device should be provided. [1910.212](#), [1910.213](#)

Drill Presses

The V-belt of all drill presses, including usual front and rear pulleys, shall be guarded to protect the operator from contact or breakage. All drill presses shall be mounted securely to the floor. [1910.212](#), [1910.219](#)

Fan Blades

All fan blades that are or may rotate (such as but not limited to: portable, mounted, and/or ceiling fan blades), lower than seven (7) feet in height or within working reach level shall be guarded. The guard will have openings no larger than one-half (1/2) of an inch. [1910.212\(a\)\(5\)](#), [1910.217](#)

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Materials Handling

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Materials Handling

Section 1: General

Materials should be segregated as to kind, size, and length. They should be placed in neat orderly stacks which are safe from falling, and well labeled. If the stacks are high, they should be stepped back as the height increases, and should be secured by cross piling or cross typing. Stacks of materials should be arranged to allow for passageways.

Materials placed on roads should be well guarded, have suitable warning signs in the day time, and have flashing lights on and around them at night. [1910.126](#)

When possible, work will be scheduled to avoid leaving materials on roads at night.

Section 2: Stacking and Piling

Employees shall be trained on proper methods for stacking and piling of materials with machinery. The following is a list of requirements when stacking and piling materials.

- Each stack should have a firm foundation.
- Round objects shall be blocked or bracketed so that they cannot roll.
- Tiers shall be cross-piled or tied so that materials support each other, if possible.
- Material shall be piled only high enough for safe lifting, handling, and storage.
- Material shall be leaned away from aisles to prevent toppling.
- Stacks shall be broken down from the top, with step backs or taper maintained.
- Materials shall not be stored as to block aisles, fire escapes, fire protection equipment, electrical panels, and other safety equipment.
- When a mechanical lifting device is used, the load shall be secured and workers shall stay out from under the load as it is lifted.
- Employees shall watch for pinching conditions, splinters, slivers, and protruding nails.

Section 3: Sack Materials

The following is a list of requirements in regards to sack materials.

- Sacked materials such as fertilizer, glass beads, Calcium Chloride, and cement should be carefully stacked when placed in storage and carefully removed so as to keep the stacks in a stable condition.
- Material will be stored so as not to create a hazard. Bags stored in tiers will be stacked, blocked, interlocked, and limited to height so that they are stable and secure against sliding or collapsing.
- When materials are removed from sacks and stored in a secondary container, the container shall be properly labeled.

Section 4: Barrels

The following is a list of requirements in regards to barrels.

- Barrels shall never be stacked more than two (2) barrels high.
- When removing the top of a barrel, a barrel cutter should be used instead of a cutting torch.



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- When handling barrels with mechanical equipment, use appropriate barrel handling equipment.
- Full barrels shall never be stacked on top of empty barrels.
- Never use barrels to support equipment or heavy objects. Barrels used as secondary containers must be properly labeled.
- Empty barrels shall be stored on their sides with the bungs or lids replaced and properly blocked.

Section 5: Pipe and Round Post Storage

The following is a list of requirements in regards to round post storage.

- All pipes, round wood, or concrete posts will be carefully stacked and blocked at the end of the pile to prevent spreading or rolling.
- When removing pipe, round posts, or barrels from a stacked pile the top items will be removed first, and employees will do this while standing at the ends of the piles to safeguard themselves from injury in case the pile should roll.
- Concrete culvert pipe twelve (12) inches or more in diameter will be lifted and handled only by machinery. Persons guiding the pipe while it is in the air will not stand beneath the load or get into a position where the load could swing and crush them against a stationary object.
- Whenever possible, a pipe hook should be used for lifting culvert pipe 12 inches or more in diameter. The hook should be of the proper size for the pipe being handled.

Section 6: Chains, Ropes, Slings, and Hoists

Special safety precautions apply to using and storing chains, ropes, slings, and hoists.

Chains

Chains shall be visually inspected to detect the following:

- Bent links.
- Cracks in weld areas, in shoulders, or in any other section of link.
- Traverse nicks and gouges.
- Stretching – If the total length of chain from hook to hook changes from original, take out of service immediately.
- Chains shall be used according to grade type and the approved working load limits.
- Alloy steel chain (Grade 80) is the only chain approved for overhead lifting. Carbon steel chains (Grade 30, 40, and 70) are used for many general utility purposes, but are not to be used for overhead lifting.
- Never use a chain that is twisted or kinked. Twisted or kinked chains shall be discarded.
- Never splice a chain by inserting a bolt between two links.
- Do not use a hammer to force a hook over a chain link.
- Do not use a chain over corners or edges if it can be avoided.
- Sudden shifts and overloading shall be avoided. The weight of objects should be known before lifting or pulling. Objects should be lifted or pulled smoothly and gradually.
- After connecting chains to the load, stand clear and as far away as possible from the pulling vehicle and the load, for a distance at least equal to the length of chain being used. If the chain should brake under tension, the end of the chain could strike you.



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- Chains not in use should be stored in a rack or other suitable container. Do not let them lie on the ground or floor where they can be damaged.

Ropes – Wire

Wire rope (cable) shall be used according to working load limits, manufacturer's instructions and recommended safety procedures. Wire rope shall be lubricated and inspected according to manufacturer's instructions. The following is a list of requirements in regards to wire ropes.

- Leather-palmed gloves shall be worn while handling wire rope and steel cable.
- Wire rope and cables shall be inspected before and after each use and replaced if they are frayed, damaged or show signs of excessive wear.
- Once a kink is formed in a cable it shall not be used for lifting, pulling, or hoisting purposes.
- The proper method of applying a clip to a cable is to always have the u-bolt over the short end and the clip over the part that carries the load. Clips shall be installed in accordance with manufacturer's recommendations. A thimble shall be used when wire rope or cable is to be looped.

Ropes – Fiber

The following is a list of requirements in regards to fiber ropes.

- Ropes shall be inspected frequently for broken strands, cuts and worn or frayed spots. Unsafe rope shall be replaced.
- Do not overload a rope. Once a rope has been overloaded, it has weakened and shall not be used.
- Avoid shock-loading, jerking and over stressing rope.
- Do not drag a rope across the ground, rough or sharp objects, or constantly across another rope.
- Ropes should be dried thoroughly after use. Frozen or wet ropes should not be placed against a heat source for quicker drying.
- Rope shall be coiled and properly stored in a dry place when not in use.

Slings

The following is a list of requirements in regards to slings.

- All alloy steel chain slings shall have a permanent ID tag stating size, grade, rated capacity and reach.
- All chain slings and chain sling components are required to be alloy steel (grade 80).
- Items to be lifted must not exceed the working load limit of the sling.
- The load shall be equally distributed between the legs of the sling. The sling assembly shall not be exposed to impact, rapid lifts or sudden stops.
- Slings used in a basket hitch shall have the loads balanced to prevent slipping.
- Employees shall be kept clear of loads being lifted and of suspended loads.
- When using slings, avoid pinch points with hands and fingers.
- Before using slings, they shall be inspected by a competent person. Additional inspections shall be performed during use, where service conditions warrant. A thorough inspection of alloy steel chain slings is required based on sling usage; however, the



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inspection interval shall not exceed 12 months. Written documentation of the thorough chain sling inspections shall be kept on file.

- Increasing the angle between the sling leg and vertical increases the stress on each leg of the sling even though the load remains the same. The recommended maximum angle is 45 degrees.

Hooks

The following is a list of requirements in regards to hooks.

- Hooks shall be of the same or greater grade as the chain to which they are attached. Chains used for lifting shall be completely within a hook so that the chain cannot slip and the hook will not be bent. Do not place a load on the tip of the hook.
- Hooks with throat openings fifteen (15%) percent greater than original, or twisted 10 degrees out of line, shall be discarded and not used.
- Safety gates should be used on hooks to prevent roll-out.

Hoist

The following is a list of requirements in regards to hoists:

- Scheduled, detailed inspection of all hoists, with special attention to load hooks, ropes, brakes, and limit switches, shall be performed each day before use. Additionally, hoists shall be inspected by a certified vendor annually and documentation kept on file at that location.
- The safe load capacity of each hoist should be shown on the hoist body of the machine.
- Loads should only be picked up only when it is directly under the hoist.
- Hoists shall not be used to lift, support or transport people.

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Mobile Devices

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Mobile Devices

The use of mobile devices while at work may present a hazard and/or distraction to the employee and fellow employees working in the same area.

Mobile devices are defined as portable computing and/or communication devices, including but not limited to cellular phones, smart phones, laptops, and tablets.

The use of mobile devices shall not pose a safety hazard or disrupt business operations. INDOT work activities, the safety of personnel, and safe operational procedures shall not be jeopardized by the use of mobile devices. Each work activity and work environment is unique and it is vital that employees evaluate the work activity and work environment for the safest possible locations to utilize a mobile device.

The use of mobile devices while driving is strongly discouraged. INDOT encourages all employees to use hands free devices. If a hands free device is not available, employees should pull over to the side of the road at the safest opportunity or pull into a rest stop or parking lot and stop the vehicle. Texting and/or reading text is not permitted while driving at any time. ([Indiana Code § IC 9-21-8-59](#))

Employees that are driving a Commercial Motor Vehicle (CMV) shall not use a hand-held, cellular phone. Driving means operating a commercial motor vehicle, including while temporarily stationary because of traffic, traffic control device, or other momentary delays. Using a hand-held mobile telephone is only permissible by drivers of a CMV when necessary to communicate with law enforcement officials or other emergency services. ([Federal Code 49 C.F.R 392.82](#))

Employees working on jobsites and/or within work zones shall find a “safe zone” for use. Employees shall not use mobile devices:

- While driving through work zones/jobsites
- While walking through work zones/jobsites
- Near moving vehicles and/or heavy equipment without a physical barrier

Employees are responsible for ensuring the safe use of mobile devices in accordance with agency, local, state, and federal laws. Failure of employees to comply may result in disciplinary action up to and including dismissal.

Supervisors and managers are responsible for ensuring employee compliance with agency, local, state, and federal laws. Failure of supervisors and managers to comply may result in disciplinary action up to and including dismissal.

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Occupational Health and Environmental Controls

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Occupational Health and Environmental Controls

Section 1: General

Occupational health and environmental controls aimed at reducing employee exposure to airborne contaminants, materials, or noise is of utmost importance in terms of employee safety and providing INDOT employees with a safe place in which to work.

Section 2: Sanitation

An adequate supply of **potable** drinking water shall be provided at all work places. Portable containers used to dispense drinking water shall be capable of being tightly closed and be equipped with a tap. Drinking water containers will be clearly marked "DRINKING WATER". Where single service cups are supplied, they will be provided in a sanitary container.

Non-drinking water will be clearly marked "NON-POTABLE" to indicate that the water is unsafe and not to be used for drinking or washing purposes.

It will be the responsibility of employees engaged in the application of paints, coatings, herbicides and other contaminants to have at least five (5) gallons of potable water at the work site.

Hand sanitizer and or hand cleaner shall be available to work crews.

If restroom facilities are not readily available, employees will be allowed to travel to the nearest restroom facility. [1910.141](#)

Section 3: Noise Exposure

When employees are subject to sound levels exceeding those permitted by IOSHA, feasible engineering controls and or administrative controls (job rotation) will be utilized. If such controls fail to reduce noise exposure to permissible levels, personal protective equipment such as two (2) different types of hearing protection will be offered and worn by employees. [1910.95](#)

Section 4: Gases, Vapors, Fumes, Dusts, and Mists

Employee exposures to hazardous chemicals above the IOSHA permissible exposure limit for hazardous airborne contaminants will be eliminated or reduced when feasibly possible.

Engineering controls such as changing to less hazardous chemicals and or Administrative Controls (job rotation) will be utilized to control exposure first. When controls are not feasible, personal protective equipment will be used to keep exposure within acceptable limits. [1910.1000](#)

Section 5: Ventilation

At times, dusts, fumes, mists, vapors, or gas exposures may occur (or are produced in the work place). When elimination or prevention of such hazards is not feasible, the hazards will be controlled by local exhaust ventilation or by general ventilation (or other effective means) to ensure employee exposure will not exceed OSHA permissible exposure limits. [1910.94](#)

Section 6: Silica Dust

Silicosis is a disease of the lungs in which the normal lung tissue is replaced by fibrous or scar tissue due to breathing air containing crystalline silica dust. Employees shall not be



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overexposed to Silica dust beyond OSHA's permissible exposure limits. Silica dust may be produced by several maintenance operations. Recommended protective measures to follow:

- Use of a pre-wetting system should be utilized to minimize the exposure to Silica dust.
- Approved respirators or air filtration equipment should be used when sandblasting.
- When cleaning the interior of shops, sheds, or other structures, use a wet/dry vac to suck up debris. Dust should not be blown into the air. When sweeping, floors should be moistened or a sweeping compound should be used.
- Approved respirator should be worn by jack hammer operators if excessive dust conditions exist. [1910.1000](#)

Section 7: Carbon Monoxide

Exposure to carbon monoxide gas could be harmful if concentrations exceed OSHA's permissible exposure limits. Carbon monoxide gas is not easily detected because it is odorless, colorless, tasteless, and non-irritating. It gives no warning of its presence.

Common sources of carbon monoxide gas are internal combustion engine exhausts and fires. Areas in which carbon monoxide gas may be present shall have properly installed and functioning carbon monoxide detector(s) and also be kept well ventilated. When possible, exhaust ventilation units should be provided and carbon monoxide detectors should be provided. Carbon monoxide, IOSHA PEL 50 parts per million (ppm) for an eight (8) hour time-weighted average (TWA). [1910.1000](#)

Section 8: Asbestos and Lead

The hazards of asbestos exposure may be found in electrical wiring, acoustical plasters, thermal insulation (heating and cooling systems), and products that resist fire. Asbestos is taken into the body through the respiratory tract (nose & mouth) and through ingestion (mouth). Exposure to asbestos has also been associated with an increased rate of kidney, esophageal (throat), laryngeal, and other types of cancers. Asbestos-related diseases might take up to 40 years after exposure to become evident. Lead, IOSHA Permissible Exposure Limit (PEL) 50 micrograms per cubic meter of air for an 8 hour time-weighted average (TWA). Asbestos, IOSHA PEL 0.1 fiber per cubic centimeter of air as an eight (8) hour time-weighted average. [Asbestos 1910.1001](#), [Lead 1910.25](#)

The most effective way to protect employees is to minimize exposure through the use of engineering controls and good work practices. Employees will not be exposed beyond OSHA's permissible exposure limits.

Lead exposures can arise from removing paint from surfaces previously coated with lead-based paint, such as vehicles and bridges.

Recommended preventive measures:

- Whenever possible, use materials containing lead products in a moist condition to avoid inhalation of the dust.
- Care should be taken to avoid inhalation of lead fumes or dust formed on top of molten lead due to oxidation.
- Do not store food in a room containing lead products.
- Do not eat or drink on the job. Go a distance away, wash hands with soap and water and clean fingernails before eating.



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- Practice personal cleanliness.

Section 9: Chemicals (Dermatitis)

When working with chemicals that can cause injury to the skin, proper precautions shall be taken. Solvents and other degreasing chemicals along with wet lime and cement particularly affect the skin. Some persons are more susceptible than others to the action of these materials.

Personal protective equipment shall be provided to minimize the worker's contact with these materials. If possible, keep the exposed parts of the body away from direct contact with any chemicals that could cause skin irritation.

When working with these materials, wash hands often and dry them thoroughly before returning to work. When the work is finished, wash the hands thoroughly with soap and warm water. Dry and apply lanolin ointment. [1910.132](#), [1910.1000](#)

On cement work, surface finishers should be provided with kneepads that are impervious to moisture.

Section 10: Epoxy Resins

Epoxies are now being used in many operations such as bonding new concrete to old concrete.

Epoxies are also used in splicing concrete pile sections, as a "cold-weld" system for joining structural steel components, and in many other applications where their peculiar attributes solve a repair or structural problem.

The use of epoxy materials often involves a mixture of compounds, many of which are toxic. The curing agent (particularly amines) and solvents are the principal health hazards, but resins are also toxic to a degree. Unless workers take proper precautions, they can develop skin rashes, severe itching, eye irritation, and respiratory ailments. Tolerance to contact varies with the individual worker, but each additional over exposure will increase sensitivity.

The personal protective equipment needed by personnel working with toxic epoxy compounds varies with the epoxy and application. Trowelling with epoxy mortar may require only plastic or rubber glove protection. Workers using epoxies shall use proper personal protective equipment to limit exposure to skin.

Epoxies, particularly those containing solvents, should never be used without adequate ventilation. Confined fumes and solvent vapors could seriously irritate the eyes, lungs, and respiratory tract and may also cause a fire and explosion hazard.

Epoxies coming into contact with the skin should be washed off immediately with soap and water. One should not use a solvent to wash skin. Many solvents are irritants themselves and will not remove the epoxy. Solvents will thin the epoxy so that it covers a greater area of skin and penetrates more deeply.

Care should also be taken to see that other employees working adjacent to the mixing or application of epoxies are provided adequate personal protective equipment, or the operation should be isolated to minimize exposure to other workers.

When employees encounter hazardous material spills on the roadway, they shall not enter the area until the incident commander on the scene has cleared the area safe for operation.



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Employees who encounter spills will need to obtain as much information as possible from a safe distance.

Information should involve:

- Material identity
- Location (nearest crossroads, mile post, etc.)
- Quantity spilled
- Direction of flow of material and wind direction
- Whether spill has reached a waterway

Employees shall remain a safe distance from a "hazardous material spill" until the material has been identified. Employees are permitted to perform other necessary work at a safe distance from the spill, such as traffic control, until police arrive at the scene to take control.

Supervisors, radio operators and other authorized personnel shall have a current copy of the Federal Department of Transportation publication "HAZARDOUS MATERIALS, EMERGENCY RESPONSE GUIDEBOOK" readily available.

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Personal Protective Equipment and Work Attire

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Personal Protective Equipment and Work Attire

Section 1: General

Personal protective equipment (PPE) provided to INDOT employees shall be in accordance with the most current applicable state and federal regulations.

Work attire and personal protective clothing/PPE shall be worn and used as required.

Employees operating machines, climbing ladders, handling material, or doing shop or manual labor shall wear clothes that are reasonably snug, particularly about the neck, wrists, and ankles. There should be no loose cuff flaps or strings. Operators may not wear loose sleeves, jewelry, watches, or loose hair; all of which may catch in power driven or other equipment. Employees assigned to shop and field activities shall wear long trousers and a shirt at all times.

Employees shall assess the work place to determine if hazards are present that necessitate use of required PPE and utilize INDOT approved PPE in accordance with the manufacturer's requirements for use, operation, and maintenance.

Supervisors are responsible for the proper training of INDOT issued PPE and ensuring employees are equipped with all required PPE. Training shall be provided for each employee who is required to use PPE. Each employee shall be trained to know the following:

- When PPE is necessary
- What PPE is necessary
- How to properly don, remove, adjust, and wear PPE
- The proper care, maintenance, useful life, and disposal of PPE.

Damaged or defective PPE shall not be used and shall be replaced immediately. 1910.132

Section 2: Head Protection

Hard Hats

Employees must wear a protective helmet when working in areas where there is a potential for injury to the head from objects or if they may be exposed to electrical shock.

Employees must replace protective helmets and their suspension systems when damaged or deteriorated, and at intervals specified by the manufacturer.

All field employees shall have a hard hat in their possession and immediately available for use. 1910.135

Bump Caps

Bump Caps are described as a lightweight head protection cap worn to prevent bumps and scrapes. Bump Caps do not replace the requirements for wearing hard hats as outlined in this chapter.

All employees working under vehicles that are hoisted on a lift shall wear INDOT approved Bump Caps as well as employees working in vehicle/equipment repair shops, personnel performing maintenance on or under heavy equipment, etc.



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Section 3: Eye and Face Protection

Employees must use appropriate eye or face protection when exposed to hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation. [1910.133a](#)

Employees shall wear protective eye and face equipment when there is a reasonable probability of injury by use of equipment and/or activity.

Each employee who wears prescription lenses shall wear protection that can be worn without obstructing the sight of the employee while engaged in operations that involve eye hazards.

No employee shall wear contact lenses where gases, vapors or other harmful materials are present which, when absorbed by the contact lenses, may harm eyes. Specifically, contact lenses shall not be worn under the following conditions:

- Where arc welding is being performed
- Where electrical arcs are customarily encountered
- Anytime the employee is handling or is exposed to any material that is likely to injure or irritate the eyes
- Anytime an employee is handling hazardous materials

Eyewash / drench showers must be provided with the work area for emergency use if there is a possibility that an employee might be exposed to injurious, corrosive materials. [1910.151c](#)

Section 4: Footwear

All field employees shall wear hard-toe, hard-soled, boots that cover the ankle and meet the American National Standards Institute's (ANSI) Z 41 or ASTM F2413 requirements. Approval must be found on the shoe. Specifically **excluded** is tennis, fabric or similar shoes. [1910.136](#)

Section 5: Gloves

Employees are required to wear the appropriate hand protection when their hands are exposed to hazards such as skin absorption of harmful substances, cuts or lacerations, abrasions, punctures, chemical burns, thermal burns, and harmful temperature extremes.

Employees working with drill presses, power saws and similar rotating machinery shall not wear gloves.

The selection of the type of glove to be worn shall be based upon an evaluation of the hazards associated with the activity being performed and the conditions present. [1910.138](#)

Section 6: Hi-Viz Safety Apparel

INDOT approved high visibility ANSI Class 3 apparel along with INDOT approved hi-viz head gear shall be worn at all times while engaged in operations upon the right of way or in a construction area. Discretion should be utilized to ensure that the appropriate garment for the job is worn when working near equipment and there is a possibility that the garment can become entangled in the equipment.

Note: All night activities require head lamps and hi-viz leg bands.

Note: Hard hats may be worn in lieu of hi-viz hat.



Personal Protective Equipment and Work Attire

Responsible Department: Statewide Safety

Last Updated: 2016

Section 7: Hearing Protection

Hearing protection shall be worn by all employees when noise levels are above normal environmental conditions. Hearing protection shall be used when sound levels are above OSHA's exposure level which is 85 dB or higher for 8 hours. [1910.95](#)

Section 8: Respirators [1910.134](#)

INDOT only permits Positive Air Pressure Respirator (PAPR) and voluntary use dust masks. PAPR's shall be worn for all high-risk activities involving respiratory irritants (IE: Welding fumes, dust containing asbestos, environmental chemical hazards, etc.). Prior to use, all components of the PAPR must be inspected per the manufacturer's recommendations for good working order. The following must be inspected: [1910.134](#)

- Blower pack
- Filter, filter date
- Battery
- Fresh air line to helmet
- All connections
- Helmet/hood

PAPR's should be used per the manufacturer's recommendation at all times. They should be cleaned and have filters replaced on a regular basis according to the manufacturers recommendations.

Voluntary Use of Respirator (Dust Mask)

Employees may volunteer to wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If respirators (dust mask) are for voluntary use; certain precautions shall be reviewed. [1910.134](#)

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. Employee must understand what the respirator is designed for and how much it provides protection.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

Section 9: Chaps/Logging

Full length, properly fitting chainsaw chaps shall be worn by all employees while operating a chainsaw. Defect or damaged chaps are not permitted for use. Employees shall wear full face masks, hard hats, and ear muffs during logging activities. [1910.266](#)

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Power Tools

Responsible Department: Statewide Safety

Last Updated: 2016

Power Tools

Section 1: General

Only trained, competent and authorized persons who are familiar with the regulations governing the use shall operate powder-actuated tools (also known as explosive actuated fastening tools). The tool shall be tested each day before loading to see that safety devices are in proper working condition. The method of testing shall be in accordance with the manufacturer's recommended procedure. Any tool found not in proper working order, or that develops a defect during use, shall be immediately removed from service and not used until properly repaired. All tools shall be used with the correct shield, guard, or attachment recommended by the manufacturer.

The majority of power tool injuries are caused by the improper handling and poor maintenance of equipment. The following applies to all types of power tools: [1926.302\(e\)](#)

- Safety equipment such as guards will be left in place.
- Hand, eye, face, ear and foot protection will be worn when needed.
- Only trained personnel will be permitted to operate power tools.
- Safety features will not be altered or removed.

Section 2: Electric Tools

Electric tools will be Underwriters Laboratory (UL) approved.

Insulating platforms, rubber mats, GFI Connectors, and rubber gloves shall be used when working with electric tools in wet or damp locations. Waterproof cords, connectors, and fixtures shall also be used.

No portable electric power tool shall be used if the operator must stand in water.

Power cables will be checked frequently for breaks in the insulation and defective cables repaired or replaced. When more than a single extension cord is connected to a power source, use twist-lock connectors. The sequence of connection will be from the tool, to the extension, and then to the power source.

Electric tools will be turned off when changing attachments, making minor adjustments, or repairing.

Electric tools shall be properly stored when not in use.

Section 3: Gasoline Engine Driven Tools

Gasoline engine tools will only be used in well-ventilated areas. Gasoline will be stored in a safe place and handled with caution.

Only properly labeled, UL-approved, safety cans which are equipped with flashback screens, vents, and pouring spouts will be used. **Never** use glass containers. Engines will be stopped and cooled before refueling.

Section 4: Circular Saws

Handheld circular saws shall be equipped with a fixed guard over the upper half of the blade and a movable guard covering the lower half of the blade. Both of these guards will be left in



Power Tools

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Last Updated: 2016

place. Blocking of the lower guard is prohibited. Small pieces being cut will be secured by bench clamps or by some other means.

Saw blades will be regularly checked and kept in good condition. The blade used will be as recommended for the material being cut. A saw will not be jammed or crowded into the work. Green or wet material will be cut slowly and with extra caution.

Operators exposed to dust, as when cutting concrete, tile, lead, or stone, exceeding OSHA's permissible levels will wear approved respirators. Check all material being cut for nails, hard knots, and other potential hazards.

Section 5: Table or Bench Saws

The operating table and surrounding area will be kept clean and clear of all debris.

Blade guards complete with splitter and non-kickback attachments will be in place and will operate freely. The saw guard or fence shall never be adjusted while the saw is running.

When ripping short stock, use of a "pusher" stick is required.

The saw will be turned off when not in use and the blade lowered below the table. The switch should be locked to prevent unauthorized use. The piece being cut will be firmly held against the back guide or fence.

All materials will be cut in a single, steady pass. It is dangerous to stop the saw before the cut is completed. If this is done, the blade will be turning freely and at full speed before the cut is resumed.

When cutting a warped board, be sure that it touches the table top at the line of the cut. Block the blade before changing.

Section 6: Radial Arm Saws

Radial Arm saws will have the upper half of the saw completely covered. A device will be provided to return the saw automatically to the back of the table when released. A limit chain or stopping device will be provided to prevent the saw from traveling beyond the front edge of the table.

If counter weights are used, they will be secured with chains or a cable fastened to the counter weights and enclosed so that they cannot fall on the operator or others if they break loose.

When ripping, an anti-kickback attachment will be provided and adjusted for the thickness of the lumber being cut.

Section 7: Chain Saws

All employees who operate a chain saw shall wear leg protection constructed with cut-resistant material, such as ballistic nylon. The leg protection shall cover the full length of the thigh to the top of the boot on each leg to protect against contact with a moving chain saw. Chain saw operators shall wear approved eye, hearing, hand, foot, and face protection as well as a hard hat. 1910.266(d)(1)(iv)

Logging First Aid kit shall be on site when chain saws are in operation.



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No one except the operator will be allowed within a ten (10) foot radius of a saw when it is in operation.

The engine shall be shut off when moving a chain saw from one location to another and operator shall hold the handle with the cutter bar directed to the rear.

When starting gasoline operated chain saws with pull cords, the saw will be held firmly on the ground or on a solid object.

Hot saws will be permitted to cool for two (2) or three (3) minutes, before refueling. A hot saw will be placed on a log, stump, or bare ground rather than on dry litter.

Refueling shall be done in an area free from flammable materials. Chain saw operators shall not wear loose clothing.

When cutting, always keep both hands on the handles. Do not cut anything above the level of the chest.

Section 8: Portable Grinders

The following are requirements regarding portable grinders: [1926.303\(c\)\(7\)](#)

- Abrasive wheels will be attached.
- Portable grinders will be equipped with hood guards.
- Wheels shall be inspected regularly. Cracked abrasive wheels shall be discarded
- The maximum rated RPM speed of the abrasive disc shall always be greater than the maximum RPM speed of the grinder.
- Grinders may not be used within twenty-five (25) feet of parts washers, oxygen and acetylene cylinders, and battery charging areas. Remove all flammable liquids and combustible materials from the area.
- Impact goggles shall be worn when using a portable grinder.

Section 9: Bench Grinders

Impact goggles shall be worn when using a bench or stand grinder, even though the grinder may have a glass shield.

Bench grinders shall be equipped with eye shields and will have wheel, spindle, and adjustable tongue guards.

Wheels will be inspected regularly and cracked wheels will be discarded.

Wheels of the proper rpm rating will be used. The maximum rated rpm of the abrasive disc shall always be greater than the maximum speed of the grinder.

Section 10: Sanders

The abrasive belt or disc cannot be guarded and the only way of avoiding injury is to use caution.

Operators shall wear safety goggles, hearing protection, and dust masks. Operators shall move the sander away from the body when using.



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Section 11: Pneumatic Tools

Pneumatic power tools will be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected.

Safety clips or retainers on pneumatic impact tools will be securely installed and maintained to prevent attachments from being accidentally expelled.

Shut off the air supply and bleed the line before disconnecting any tools. The use of hoses for hoisting or lowering tools is not permitted.

All hoses exceeding one-half (1/2) of an inch in diameter will have a safety device at the source of the supply or branch line to reduce pressure in case of hose failure.

Operators of portable air tools such as jackhammers, air tamps, etc., shall wear required PPE.

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Reports and Investigations

Responsible Department: Statewide Safety

Last Updated: 2016

Reports and Investigations

Definitions

Crash

A crash is an occurrence, excluding vandalism and acts of nature, which results in monetary damage to any vehicle, property, or heavy equipment (inclusive of attenuators / arrow boards).

Serious Crash

A crash that requires the vehicle or heavy equipment (inclusive of attenuators / arrow boards) to be towed from the scene and/or rendered inoperable.

Injury

An injury is any occurrence when an INDOT employee must seek medical treatment from a professional medical center.

Serious Injury

An injury that requires hospitalization of an employee.

Incident

An incident is any occurrence when basic first aid is administered on the job site but employee does not seek professional medical treatment or when vehicle/heavy equipment makes contact with another state owned object and does not result in monetary damage.

Near Miss

A near miss is any occurrence that almost resulted in injury and/or contact to a vehicle, heavy equipment or person as determined by INDOT employees through their direct supervisor and/or Safety Director.

Unsafe Act

An unsafe act is any act that deviates from a generally recognized safe practice or specified method of doing a job and results in a crash, injury, incident, or near miss. It is unsatisfactory behavior that is significant in initiating the occurrence. Examples of unsafe acts include choosing short cuts, using defective equipment and lack of attention.

Preventable

Any occurrence that could have been prevented by any INDOT employee (example: co-worker, supervisor), agency policy, facility hazards, faulty equipment, or maintenance. Examples of preventable occurrences are slip, trips, falls, strains, and sprains.

Non-Preventable

Any occurrence that is unforeseen and unpredictable.

Occurrence

An occurrence is a crash, injury, incident, or near miss.

Section 1: General

Some of the most important and essential aspects of an effective Safety Program are:



Reports and Investigations

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- Properly defining crashes, illnesses, and injuries.
- Properly reporting all occurrences.
- Conducting root cause investigations
- Taking necessary actions to prevent similar occurrences throughout the department.

Employees must notify their supervisor immediately of an occurrence. The supervisor must notify safety and human resources immediately during normal business hours. If after business hours the supervisor must notify safety and human resources within the first hour of normal business hours. If a serious crash or injury occurs outside of normal business hours the supervisor shall notify their Safety representative immediately.

Supervisors shall ensure original notification within Safety Occurrence System (SOS). Supervisors shall enter all required data into the SOS.

Supervisors shall be responsible for conducting an investigation for each occurrence and defining the root cause and recommendations for preventability of future occurrences. Safety shall assist with all investigations resulting in a serious injury or serious accident.

Supervisors of the employee involved in the occurrence are responsible for categorizing the occurrence in accordance with the definitions of this policy.

District Safety Directors and Statewide Safety Director are responsible for ensuring compliance and accurate reporting of the definitions within this policy. All crashes, injuries, incidents, and near misses must be entered into the INDOT SOS.

An employee involved in a vehicle accident with private vehicles or persons shall not accept responsibility or blame on behalf of the department. Nor should the employee discuss it with anyone but his supervisor or a representative of the agency, nor shall information about the accident be given to persons other than proper law enforcement authorities or Attorney General personnel.

Tort claim processing procedures shall be provided to private persons involved in crashes with department vehicles/equipment.

Section 2: Root Cause Analysis

A root cause analysis is a process designed for use in investigating what, how, and why an occurrence happened. Conducting a root cause analysis identifies the underlying cause(s) of why the occurrence happened.

The immediate supervisor shall conduct a root cause analysis when investigating a safety occurrence. By identifying the underlying causes, the supervisor is able to develop recommendations that will assist in preventing reoccurrence.

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Rope Access Program

Responsible Department: Statewide Safety

Last Updated: 2016

Rope Access Program

Section 1: General

A person authorized by their employer to be responsible for managing the employer's rope access program, who is suitably knowledgeable, experienced, and qualified to manage the rope access program, including matters relating to safety, training, regulations, staffing, equipment selection, and management, and other program responsibilities as designated by the employer.

The Rope Access Program Administrator, the statewide safety technical specialist, shall be the main point of contact for matters relating to the safety, training, and regulatory aspects of the Rope Access Program.

Prior to an INDOT employee participating in any rope access work activity, the rope access program administrator shall be contacted for the proper training and approved rope access equipment list.

All employees interested in rope access and becoming an INDOT Rope Access Technician shall attend INDOT training sessions when held, including the week long yearly training held in the fall. During these training sessions employees will learn all the requirements of a level 1 technician listed below as well as general rope access safety concerns, JHA's, and up to date rope access regulations.

Once the employee is competent at conducting the below level 1 technician requirements and the INDOT rope access program administrator has approved the skill level of the employee, they shall attend a Society for Professional Rope Access Technicians (SPRAT) level 1 technician course to become certified. The program administrator will assist employees in what course and location the SPRAT course will be held.

Section 2: Rope Access Technician

A person who has completed a rope access certification program and has the appropriate training and experience to perform the duties required according to the assigned level of responsibility.

Section 3: Level 1 Technician (Rope Access Worker)

Requirements

Roles and Responsibilities

Technician must be able to demonstrate an understanding of the responsibilities of a level 1 technician and how these fit into the overall responsibilities of the rope access program.

Equipment Use and Inspection

Technician must be able to demonstrate an understanding of proper use, inspection, and care of all equipment required for the technical skills.

Job Safety

Technician must be able to demonstrate an understanding of the employer's safety management program, relevant policies, work permits, work zones, and job hazard analysis (JHA), as well as emergency procedures.



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Knots

Technician shall demonstrate the tying of the following knots and have an awareness of their applications, strength, and limitations:

- End or termination knot (e.g. Figure 8, Figure 9, Bowline)
- Knot to join two ropes (e.g. Double Fisherman's, Flemish Bend)
- Middle Knot (e.g. Butterfly)
- Stopper knot to prevent descending off the end of ropes (e.g. Barrel Knot)

Back-up Devices and Use of Two-Rope System

Technician shall demonstrate the use of an appropriate back-up device attached to a secondary safety rope in accordance with industry best practice. Maintaining a sound connection to two independently anchored ropes at all times is expected. Some technical maneuvers require a connection to up to four ropes at a time. Technician should pay particular attention to the following:

- Positioning the device to prevent excessive falls
- Connecting to it with an appropriate lanyard type (Dynamic) and length (20")
- Pairing the device to an appropriate rope type and diameter (typically Static Rope 11mm or 7/16" diameter)
- Paying attention to not incapacitating the device through improper handling
- Following all manufacturer recommendations in the proper use of the device

Use of Descenders (Descent Control Devices e.g. ID)

Technician shall demonstrate the proper use of a descender attached to the main working line. A variety of systems will be accepted if used consistent with industry best practices and manufacturer recommendations. Some considerations include:

- Technician must demonstrate controlled descent, stopping, and locking / tying off as appropriate.
- Failing to lock-off the device properly when the technician is stopped and not in control of the slack end of the rope will constitute a discrepancy.
- Operating or triggering a descender without proper control of the slack end of the rope will result in a discrepancy or failure depending on the severity of the error.
- Use of an auto-stop descender is required (ID); however, technician must know how to add a friction device to create a fail-to-stop mechanism without relying on the secondary safety rope.
- If the descender can be used to ascend, the technician will be asked to ascend at least 2 meters (6.6 feet) using the descender.

Use of Ascenders

Technician shall demonstrate the proper use of an appropriate ascending system connected to the main working line. A variety of system will be accepted if used consistent with industry best practice and manufacturer's recommendations. Some considerations include:

- Technician can climb 10 meters (33 feet) efficiently and without physical duress
- Technician can climb down 2 meters (6.6 feet) using the ascenders.



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- The ascenders should be properly attached to the candidate to increase safety and prevent equipment from being inadvertently dropped
- Since most ascenders with teeth are not designed to withstand a dynamic one-person load, technicians should always use ascenders in such a way to eliminate a dynamic fall onto the ascenders
- A single ascender connection to the working rope is acceptable as long as the dynamic fall potential is limited to less than 1 foot or eliminated entirely

Use of Work Seat

Technician shall demonstrate the safe use of a work seat while maintaining a solid connection to both the working and safety rope. (If Applicable)

Passing Knots

Technician shall demonstrate ascending and descending past a knot tied into the middle of the rope that has been placed there temporarily to isolate a damaged section of rope. The damaged section of rope shall not be used as a connection point. Two back-up devices can be used; however, in the event a second back-up device is not available the technician must be aware of how to use an appropriate knot (butterfly) as a secondary back-up.

Rope-to-Rope Transfers

Technicians shall demonstrate transferring from one pair of ropes to another pair of ropes anchored more than 2 meters (6.6 feet) apart. Some considerations include:

- A proper connection to 4 ropes is expected to control the swing potential if one rope failed during the maneuver.
- Two back-up devices should be used; however, in the event a second back-up device is not available the technician must be aware of how to use an appropriate knot as a secondary back-up.
- The technician may be required to approach the rope-to-rope transfer from above or below; however, it is recommended that the maneuver is started in descent mode.

Deviation (redirect)

Technicians shall demonstrate ascending and descending past an anchor that deviates the rope by no more than 20 degrees. Some considerations include:

- A single deviation anchor point is acceptable if there is no safety consequence of its failure.
- Many appropriate field anchors for deviations may not be appropriate for taking the load of a technician in the vertical plane and should not be relied upon as a point of connection.
- Provision for returning to the anchor from above and facilitating a rescue or repeated use from below should be considered.

Short Reelay (Passing an Intermediate Anchor)

Technician shall demonstrate ascending and descending past an intermediate anchor that is less than 2 meters (6.6 feet) horizontally from the anchors above. Due to some field circumstances the anchor itself may not always be relied upon as a point of connection (e.g.



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rope threaded through a grating or hole). The intermediate anchor and the top anchor can be used to maintain two points of attachment.

Long Rebelay

Technicians shall demonstrate ascending and descending past an intermediate anchor that is greater than 2 meters (6.6 feet) horizontally from the anchors above. Due to some field circumstances the anchor itself may not always be relied upon as a point of connection (e.g. rope threaded through a grating or hole). The technician should use the 4-point technique similar to that used in a rope-to-rope transfer and should take care not to pull the rope from below across potential hazards or obstacles during the maneuver.

Negotiate Edge

Technicians shall demonstrate safely negotiating an edge obstruction while on ascent and descent. This task should simulate field conditions experienced when negotiating the edge of a roof, cliff face, or parapet wall. Ideally the anchors should be at least 2 meters (6.6 feet) from an unprotected edge and be located on the horizontal surface or within 2 meters (6.6 feet) above the horizontal surface. If the edge is protected by a railing, the technician may need to climb under the railing to demonstrate the edge negotiation. Proper edge protection, controlled movement, and avoidance of shock loads must be demonstrated.

Rope and Sling Protection

Technician shall demonstrate awareness and proper use of rope and sling protection as required by the training site. The technician will be asked to pass a rope protector installed on both the working and safety lines.

Simple Structural Anchor

Technician shall demonstrate establishing a simple anchor for a two-rope system around a structural member (e.g. steel beam). Proper use of hardware, choice of sling material, and appropriate sling protection will be considered.

General Anchor Inspection

Technician must know how to inspect and verify the integrity of more complex anchors that may be built in the field by a higher level technician.

Climbing with Shock-Absorbing Lanyards

Technician must be aware of the limited shock-absorbing qualities of most lanyards (cow's tail) used in rope access. Candidate can demonstrate climbing vertically and/or horizontally on a structure using a shock absorbing y-lanyard system. Special attention should be paid to the proper use and compatibility of connectors, awareness, and management of fall clearance distance, and general use of the lanyard.

Belaying with Communication

Technician will be asked to manage the safety rope of another worker. Consistent communication between belayer and worker is expected. The choice of belay device is not specified, however, the method should be accepted industry practice and/or consistent with the manufacturer's instructions. A self-braking device is not required as long as the proper techniques are demonstrated.



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Lowering

Technicians shall demonstrate lowering another worker from a fixed anchor using an appropriate descent control device attached to a fixed anchor. Technicians may be asked to stop and lock-off the device. Additional friction may be required and should be consistent with the manufacturer's instructions.

Pick-off Casualty on Descent

Technicians will be asked to perform a pick-off rescue of an incapacitated casualty while in descent mode. A separate set of ropes is not required; however, technicians should understand when a separate set of ropes might be needed and how to perform the rescue. Emphasis will be placed on maintaining two points of attachment to the casualty and the ropes. Considerations should be given to the effects of a two-person load on the descender and back-up-device. Extra friction may be required for a two-person load. The technician shall perform an initial scene safety survey before carrying out any rescues. Proper casualty management should be considered and demonstrated.

Awareness of Simple Mechanical Advantage Systems

Technician should be aware of simple mechanical advantage systems in order to participate in building or operating systems for utility or rescue hauling under the direction of a higher level technician.

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Safety Briefings and Hazard Reviews

Responsible Department: Statewide Safety

Last Updated: 2016

Safety Briefings and Hazard Reviews

The on-site leader of any field activity shall conduct a safety brief and hazard review for each activity on a daily schedule.

At a minimum the safety brief and hazard review shall include:

- Proper PPE for each activity
- All safety hazards associated with equipment and machinery
- All hazards and precautions necessary for weather conditions
- All safety hazards of roadway (curves, hills) and topography (trees, bushes, etc.)
- Review work zone requirements according to Indiana Manual of Uniform of Traffic Control Devices (IMUTCD) and Traffic Control Plan (TCP).

All employees shall participate in the brief and be held accountable for understanding the safety and hazards for their assigned activity.

The on-site leader of an activity shall ensure that the potential hazards associated with the activities have been identified and mitigated. A daily safety briefing and hazard review must be kept on file.

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Safety Occurrence Reporting Guidelines

Responsible Department: Statewide Safety

Last Updated: 2016

Safety Occurrence Reporting Guidelines

Definitions

Crash

A crash is an occurrence, excluding vandalism and acts of nature, that results in monetary damage to any vehicle, property or heavy equipment (inclusive of attenuators/arrow boards).

Serious Crash

A crash that requires the vehicle or heavy equipment (inclusive of attenuators/arrow boards) to be towed from the scene and/or rendered inoperable.

Injury

An injury is any occurrence when an INDOT employee must seek medical treatment from a professional medical center. Non-recordable injury.

Serious Injury

An injury that requires hospitalization of an employee. Recordable OSHA injury.

Incident

An incident is any occurrence when basic first aid is administered on the job site but employee does not seek professional medical treatment or when vehicle/heavy equipment makes contact with another state owned object and does not result in monetary damage.

Near Miss

A near miss is any occurrence that almost resulted in injury and/or contact to a vehicle, heavy equipment or person as determined by INDOT employees through their direct supervisor and/or Safety Director.

Unsafe Act

An unsafe act is any act that deviates from a generally recognized safe practice or specified method of doing a job and results in a crash, injury, incident or near miss. It is unsatisfactory behavior that is significant in initiating the occurrence. Examples of unsafe acts include choosing short cuts and using defective equipment.

Preventable

Any occurrence that could have been prevented by any INDOT employee (example: co-worker, supervisor), agency policy, facility hazards, faulty equipment or maintenance. Examples of preventable occurrences are slip, trips, falls, strains and sprains.

Non-Preventable

Any occurrence that is unforeseen and unpredictable.

Occurrence

An occurrence is a crash, injury, incident or near miss.



Safety Occurrence Reporting Guidelines

Responsible Department: Statewide Safety

Last Updated: 2016

Section 1: Purpose

The Indiana Department of Transportation (INDOT) is dedicated to the protection of its employees from workplace crashes and injuries. The purpose of these guidelines shall be utilized to communicate and document all crashes, injuries, incidents and near misses to maintain factual records and to prevent future occurrences.

Section 2: Scope

Applies to all Indiana Department of Transportation (INDOT) employees.

Section 3: Statement of Policy

Employees must notify their supervisor immediately of an occurrence. The supervisor must notify safety and human resources immediately during normal business hours; if after business hours, the supervisor must notify safety and human resources within the first hour of normal business hours. If a serious crash or injury occurs outside of normal business hours the supervisor shall notify their Safety representative immediately.

Supervisors or designee shall ensure original notification within SOS and begin the investigation the day of the occurrence. Supervisors or designee shall enter all required data into the Safety Occurrence System (SOS).

Supervisors shall be responsible for conducting an investigation for each occurrence and defining the root cause and recommendations for preventability of future occurrences. Safety shall assist with all investigations resulting in a serious injury or serious accident.

Section 4: Responsibility

Supervisors of the employee involved in the occurrence are responsible for categorizing the occurrence in accordance with the definitions of these guidelines.

District Safety Directors and Statewide Safety Director are responsible for ensuring compliance and accurate reporting of the definitions. All crashes, injuries, incidents, and near misses must be entered into the INDOT Safety Occurrence System (SOS).

Exceptions to the guidelines must be approved by the Statewide Safety Director.

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Traffic Control

Responsible Department: Statewide Safety

Last Updated: 2016

Traffic Control

Section 1: General

All work zone traffic control and devices shall conform to the provisions and specifications of the Indiana Manual on Uniform Traffic Control Devices (IMUTCD) and INDOT's Temporary Traffic Control (TTC) required procedures. The TTC procedures shall be a more amplified version of the IMUTCD standards that are condensed and tailored to the needs of INDOT in identifying various possible temporary work zone configurations.

Employees shall take every reasonable precaution to protect themselves and the public from accidents caused by work zone operations. TTC shall be utilized when any activity impedes the flow of traffic. TTC plans shall be documented and reviewed with all employees.

In situations where a vehicle with warning lights displayed parked on the shoulder or side of the roadway is the only required traffic control, the vehicle shall be parked in a manner to minimize surprise or disruption to the public. The vehicle shall act as a warning barrier between oncoming traffic and personnel. Personnel will position themselves far enough from the vehicle so to avoid being struck by the parked vehicle should it get hit.

At no time will personnel perform work on or near the traveled portion of the roadway without the appropriate traffic control.

Protection consists of two (2) phases:

- Advance warning to the public of something out of the ordinary
- Warning throughout the time that the hazardous condition exists

Warning and protective devices such as signs, channeling devices, and barricades will be displayed before work begins and will be maintained throughout the job.

Unauthorized personnel and unauthorized vehicles shall not be permitted within the limits of the worksite.

All traffic control devices shall be kept clean and legible.

Section 2: Warning Signs

Placement of Advanced Warning Signs shall be in accordance with TTC per INDOT requirements. The proper distance will vary based on the speed limit, type of roadway, and surface, grades, curvatures, and sight distance. When working on a hill or sharp curve, warning signs must be placed at the top of the hill, the point of curvature or right before the curve begins. This also applies to placement of flaggers.

Do not block the sight line vision of drivers with warning signs. Signs should be clearly visible and easy to read. If operations involve movement of employees or equipment along the roadway, move the signs with the work. Remove all warning signs when employees or equipment are not working, and when no obstruction or danger points exist.

Special problems in traffic control, along with the use of additional warning signs and/or if more specific instructions are needed, for setting up warning signs shall be discussed with the supervisory personnel. The results of this discussion shall be logged on the Job Safety Briefing.



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Signs needing repair, repainting, or re-lettering will be removed and replaced.

Section 3: Channeling Devices

All Traffic Control channeling devices shall meet the requirements per the IMUTCD and INDOT TTC

Channeling devices include:

- Cones
- Tubular Markers
- Vertical Panels
- Drums
- Barricades
- Barriers

Section 4: Other Traffic Control Devices

- Arrow Boards
 - Arrow boards in the arrow or chevron mode may be used to supplement signs and other devices for lane closures on multilane roadways.
 - Arrow boards in the “Caution Mode” shall be used only to close a shoulder and may be used on two-lane, two-way roads.
- Shadow Vehicles
 - A Dump Truck meeting the requirements of the INDOT TTC used to provide guidance of traffic and protection of the work crew from the traffic.

Section 5: Flaggers

- Flaggers shall meet the requirements of the IMUTCD Part 6E. Flagger Control.
- All flaggers shall be INDOT Certified Flaggers.

Flaggers shall remain at the proper distance from the work in accordance with TTC. Flaggers will stand just outside of the approaching traffic lane, but near enough to the workers so that there is no doubt as to their purpose. This distance may vary depending upon road conditions, visibility, and location in regard to curves and hills. The flaggers shall position themselves so that approaching traffic can see them from a distance, and positioned with a stop-slow paddle visible from the traffic lane, but not jeopardizing their own safety. They shall have an escape route and must be ready to move clear if approaching traffic does not stop.

Flaggers shall use a portable radio, stop/slow paddle, or flag (if appropriate).

A flagger must never leave his/her post until properly relieved by another employee.

Additional flaggers shall be assigned due to multiple intersections, sight distance issues or sight relay of flagging instructions due to communications failure or if emergency conditions arise.

Primary flagger shall be assigned and identified to make decisions on traffic movement rotation through the work zone. This does not relieve the supervisor in charge of the responsibilities of the work zone.

The assigned supervisor is responsible:



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- To ensure flaggers are INDOT Certified
- For proper behavior of the flagger, regardless of the distance between the flag station and the work area.
- For making sure the flaggers are performing their duties properly and are:
 - Alert
 - Properly attired
 - Courteous
 - Periodically relieved of their flagging duties

Flagging operations are required in the following traffic situations when:

- One lane is alternately used for both directions of travel.
- The roadway is closed for a short period of time to accommodate specific temporary operations.
- Supplementing traffic control devices is needed to reduce traffic speed.
- Inadequate motorist sight distance does not provide sufficient advance warning of highway work activities.
- Opposing traffic flow needs to be handled at an intersection.
- Installing and removing traffic control devices.
- Other situations where variable conditions require the exercise of judgment.

Section 6: Slow Moving Emblem

Slow-moving vehicles will display a slow-moving vehicle emblem. These vehicles are described as those which are pulled, towed, self-propelled, or horse drawn. This includes all vehicles that are not under normal circumstances moved, operated, or driven at a speed greater than twenty-five (25) miles per hour. The emblem will be used in addition to any lighting devices.

Whenever a vehicle is moved, operated, or driven on a highway that is open for vehicular travel, the vehicle shall display a triangular slow moving vehicle emblem mounted as near as is practicable to the center of mass and at an approximate height of not less than three (3) and not more than five (5) feet from level ground or pavement surface. The emblem shall be mounted so as to be entirely visible from the rear, day or night. The emblem and the emblem's position of mounting on the vehicle must meet the specifications established by rules adopted by the Indiana criminal justice institute.

The use of this emblem is restricted to slow moving vehicles as described. The use of the emblem on any other type of vehicle or stationary object on or along the highway is prohibited.

Section 7: Warning Lights

The use of proper operating Vehicle Warning Lights is very important to the safety of the motorist and department employees. Operation of warning lights, when not warranted, creates disrespect for the device by the motorist and reduces the effectiveness of the device, when actually needed.

Department employees shall stop or park vehicles and equipment beyond the edge of the roadway and off the shoulder whenever practical.

Operators of department equipment or vehicles shall use warning lights:



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- Whenever it is necessary for any department vehicle to stop partially or entirely on the pavement surface or when a vehicle must park on the shoulders of the roadway or median for the purpose of warning motorists of possible work crews or personnel.
- When placing or taking down of Traffic Control Devices for work zones.
- When required by INDOT TTC.
- Whenever equipment is operated on rural interstate highways at speeds lower than 45 miles per hour and on other highways at speeds less than 35 miles per hour. Four-way Hazard Lights can be used to supplement but shall not replace the use of Warning Lights.
- All vehicular lighting shall conform to INDOT Lighting Policy.

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Towing and Recovery

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Towing and Recovery

Section 1: Towing Disabled INDOT Vehicles and Equipment over the Road

Towing a disabled vehicle is an extremely dangerous activity. Disabled INDOT vehicles or equipment **shall not be towed over the road by any INDOT employee** due to Indiana Towing Laws and Indiana Code Sec. 9

Employees should use one of the two methods below to transport disabled vehicles and equipment back to an INDOT Facility:

1. Tow Company shall be contacted.
2. Lowboy or other type of trailer capable of carrying a vehicle shall be used.

Section 2: Towing Vehicles and Equipment on INDOT Property

Equipment and vehicles can be towed no faster than 5 mph in an INDOT lot as long as the correctly rated synthetic webbing strap is used per the Working Load Limit (WLL). The WLL can be found on the synthetic webbing straps tag and is the maximum allowable load that can be applied to the strap and is **not** to be exceeded. This tag must be up to date on all yearly inspections. Chains shall not be used for any towing activities due to the extreme danger and risk of breaking.

Section 3: Hoosier Helpers Vehicle Tow/Relocation

Hoosier Helper employees may tow/relocate a broken-down vehicle, a vehicle that has been involved in an accident, or a piece of equipment to a safe location out of the way of the traveling public for both the safety of the INDOT employee and the public. The towing/relocation shall not exceed 5 mph and all equipment to perform the tow/relocation shall be rated and tagged per the application's WLL it is being used for.

Chains

Chains are intended to be used at or below the WLL specified by the manufacturer in constantly increasing force applications under direct tension. Chains are only designed for a load with constant pressure applied to it (for example, to tie down a piece of equipment on a trailer, hoisting, and lifting).

Shock loading is prohibited and must be avoided as it exerts additional dynamic forces or loading which the product is not designed to accommodate. Shock loading occurs when slack in the chain is formed between the two vehicles and the towing vehicle moves forward and quickly tightens up the chain tension thus creating a shock load. Chains are not designed to stretch; therefore, they cannot handle a shock load unlike synthetic webbing and rope that is designed to stretch when shock loaded.

Chains and slings training (hoisting)

Anyone that is required to use a chain or sling must go through training. All chains/slings must be rated, tagged, and inspected regularly, once a year at a minimum, and before each use by a trained, competent person.



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Slings shall not be made in house.

Section 4: Recovery of Vehicles and Equipment

Recovering a vehicle or piece of equipment that has become stuck in the snow, mud, or has slid off the road shall only be performed by those who have been properly trained to do so.

Shackles, and the correctly rated rope or webbing, are approved to be used to pull the equipment/vehicle back onto the roadway. Chains shall not be used for any recovery due to the extreme danger and risk of breaking.

Recovery Equipment

- Bubba Rope; Extreme Bubba (WLL) 131,500 LBS used for dump trucks and large equipment
- Bubba Rope; Big Bubba (WLL) 52,300 LBS used for crew cabs and small equipment
- Any equivalent synthetic webbing strap
 - Synthetic webbing recovery straps can be obtained through Fastenal.

It is strongly suggested to use soft shackles rather than metal shackles due to the potential of breaking and the “sling shot” effect of a flying metal shackle.

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Vehicle and Equipment Operations

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Vehicle and Equipment Operations

Section 1: General

Vehicles and equipment will be operated in compliance with the law and the directives of the agency. They will not be driven or road tested at speeds in excess of the established speed limits, nor at speeds greater than is reasonable and prudent under the existing conditions.

Only authorized operators shall operate INDOT vehicles and or equipment.

An authorized operator is defined as a person properly trained by INDOT or those that possess a license or certification that has been verified by INDOT.

If licenses and or certification cards are required for vehicle or equipment operation, employees shall carry corresponding documentation on their person. Completion of training and verification of qualification shall be documented and entered in the employees training folder. Copies of all licenses and or certification cards shall be retained in their personnel records.

Due to the various types of equipment, licenses, and/or certification, cards may not be feasible for each piece of equipment. A properly documented training outline along with the name of the trainer and trainee and their signatures shall be retained as a certification document.

Vehicle/equipment operators will reduce vehicle speed during periods of poor visibility caused by fog, smoke, rain, or snow and will turn on the headlamps of their vehicles as an added precaution. When visibility makes operations unsafe, the vehicle will be stopped and parked clear of the traffic lanes and remain there until driving can be safely resumed.

No operator will start, stop, slow down, turn, or back his/her vehicle without making certain that the movement can be done safely, using proper signals and agency policy.

Heavy equipment operators should shift into lower gear before descending steep hills and will not disengage the gears and coast at any time.

An employee will not start the engine on self-propelled equipment unless he/she is seated in the driver's seat and is certain that the gears are disengaged.

Section 2: Seatbelts

All employees shall wear a seatbelt.

Approved seatbelts shall be installed by the manufacturer. All employees driving or riding as passengers in INDOT vehicles shall properly wear seatbelts whenever the vehicle/equipment is in motion as it is required by Indiana Law. All worn or damaged seatbelts shall be replaced immediately.

The driver of the vehicle shall not engage the vehicle until all passengers fasten their seatbelts.

The only exception to this requirement is that seatbelts will not be installed or worn on equipment not having Roll Over Protective Structures (ROPS). In cases where it is impossible to properly operate the equipment when wearing a seatbelt, i.e. grader, the belt may be temporarily unlatched.



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Section 3: Pre-Trip Inspections

All vehicle operators shall perform a vehicle safety inspection prior to the initial dispatch of the vehicle before each shift.

The procedures followed in conducting the inspection shall conform to those set forth by the office of Fleet and Facilities Management. Operators shall report all safety defects or deficiencies to their supervisor. Supervisors shall enter all safety defects into the M5 system according to standard operating procedure. Vehicles with known safety defects or deficiencies shall not be operated.

Section 4: Service of Vehicle and/or Equipment

Motor vehicles, while being driven in or out of garages or storage buildings, shall be driven at a low rate of speed and shall stop at the doorway before entering or exiting the building.

Employees shall ensure that engines are not started and vehicles are not moved while they are working on vehicles by following the Lockout/Tagout Policy and Procedures. Additionally, employees shall:

- Ensure that engines operate only when there is proper ventilation, and/or exhausts are vented to the outside to prevent carbon monoxide poisoning.
- Industry approved dump lock system shall be used underneath dump truck boxes for the protection of employees inspecting or repairing underneath.
- Vehicles and equipment shall be chocked whenever a vehicle is being serviced.

Section 5: Parking

No vehicles/equipment will stop or park on the traveled portion of the roadway when it is practical to stop or park off the roadway, unless doing so is required in the line of duty.

Vehicles/equipment will not stop or park where it may interfere with the movement of other vehicles or be in close proximity to working operations. Vehicles/equipment will not be parked or left adjacent to the roadway in such a manner as to constitute a traffic hazard, nor will they be parked on a curve or hill where they will obstruct sight distances or parked with buckets up. Operators will not park vehicles/equipment without first setting the brakes. Chocks may be placed under the wheels as an additional precaution. Any vehicle being loaded or unloaded at a dock, with a forklift or mechanical handling equipment, will have both rear wheels chocked.

When parking non-motorized equipment (trailers, air compressors, tar kettles, arrow boards, etc.) that do not have brakes, the wheels should be chocked to prevent any movement.

Vehicle doors will be kept closed while the unit is in motion and will not be left open while the vehicle is parked.

No one will open the door of a vehicle on the side available to moving traffic, unless and until it is reasonably safe to do so and it can be done without interfering with the movement of traffic.

Section 6: Riding on Vehicles

Employees shall not ride in a truck bed unless using Fall Arrest System with proper Fall Protection training due to job requirements. Employees shall not sit on the edge of the truck bed, tailgate, or lift gate when vehicle is in motion.



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Employees shall not ride on the hood, running board, or fender of any vehicle/equipment. No one is permitted to get on or off a vehicle while it is in motion.

Section 7: Power Industrial Trucks / Training and Certification

All employees shall be trained and/or certified in accordance with state regulations and agency policies and procedures before operating all powered equipment. All employees must adhere to manufacture operations manual. All training and certifications shall be documented and accessible on request. [1910.178](#)

Employees required to operate Powered Industrial Trucks must be certified by a competent trainer and evaluated at a minimum of every three (3) years. Documentation of certification must include the name of the operator, the date of the training, date of the evaluation, and identity of competent trainer.

Power Industrial Trucks are defined as fork trucks, tractors, platform lift trucks, motorized hand trucks, and other specialized industrial trucks powered by electrical motors or internal combustible engines.

Section 8: Backing Safety

Avoid backing whenever possible.

A ground guide shall be used if backing is required and there is obstructed vision to the rear. The only time it is permissible to back a vehicle, with obstructed vision without a ground guide is when the driver is alone and backing is essential.

When ground guides are not available, all operators shall personally ensure that it is clear to back prior to beginning backward motion. For vehicles having obstructed vision immediately to the rear, i.e. dump trucks, pick-up trucks with sign racks in the bed and other large vehicles, this will involve the driver/operator physically moving to the rear of the vehicle and ensuring that all is clear. Prior to, and after backing has commenced, side view mirrors shall be constantly checked to ensure that conditions remain safe for backing. For vehicles not having obstructed vision to the rear, i.e. sedans, pickup trucks, etc., the operator shall turn around and check the complete area surrounding the vehicle to ensure that it is safe to back. In all cases, operators shall also check for people or traffic approaching from the side. Back as soon as possible after checking conditions in the rear. If there is a delay in backing, personally recheck the rear of the vehicle. In all cases, ensure it is clear just prior to backing. Always back slowly and cautiously.

Operators shall warn others who may be near a backing vehicle/equipment, by sounding the horn and/or radio contact. Vehicles equipped with backup alarms shall have alarms in an operational condition at all times.

Supervisors and operators of vehicles/equipment equipped with backup alarms are responsible for inspecting and reporting defective alarms.

Section 9: Ground Guides

Supervisors shall see that all of their employees, who may be called upon to act as ground guides for backing operations, are instructed in the proper methods. Supervisors shall ensure that these methods be employed at all times.



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The methods to be used follow:

Employees giving directions to the driver shall:

- Stand on the ground at the rear of the vehicle/equipment in clear view of the driver.
- Stand in full view of traffic, both vehicular and pedestrian.
- Stand in full view of the area where the vehicle is about to back. If all three conditions cannot be met, an additional guide shall be used.

Employees directing a truck in a backing operation must keep a safe distance between themselves and the backing vehicle so that they will not be struck by the vehicle they are directing. They must maintain a safe distance during the entire backing operation. They must stay in a path outside the width of the backing vehicle, where they are visible in the rear view or side mirror. They must also be mindful of oncoming traffic in both directions.

The ground guide must also consider the condition of the ground they are going to walk over. Plan to stop the backing vehicles several times during the backing maneuver. If there is any doubt in the mind of the employee providing the guidance to the driver about conditions in the area, the guide shall stop the driver and make them aware of the conditions.

The driver/operator will only back the vehicle as long as the ground guide is in sight and he/she understands the instructions being given by the guide. If for any reason the ground guide is no longer in view, or there is confusion regarding the instructions, the vehicle will be stopped immediately and problem area corrected.

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Walking and Working Surfaces

Section 1: General

Many slips, trips, and falls injuries are a direct result of non-compliance with OSHA and departmental guidelines for walking and working surfaces.

All places of employment, passageways, storerooms, and service rooms shall be kept clean and orderly and in a sanitary condition. 1910.22(a)(1)

The floor of every workroom shall be maintained in a clean and, so far as possible, dry condition. Where wet processes are used, drainage shall be maintained, and false floors, platforms, mats, or other dry standing places should be provided where practical. 1910.22(a)(2)

To facilitate cleaning, every floor, working place, and passageway shall be kept free from protruding nails, splinters, holes, or loose boards. 1910.22 (a)(3)

Where mechanical handling equipment is used, sufficient safe clearances shall be allowed for aisles, at loading docks, through doorways, and wherever turns or passage must be made. Aisles and passageways shall be kept clear and in good repairs, with no obstruction across or in aisles that could create a hazard. 1910.22(b)(1)

Permanent aisles and passageways shall be appropriately marked. 1910.22(b)(2)

Covers and/or guardrails shall be provided to protect personnel from the hazards of open pits, tanks, vats, ditches, etc. 1910.22(C)

In every building or other structure, or part thereof, used for mercantile, business, industrial, or storage purposes, the loads approved by the building official shall be marked on plates of approved design which shall be supplied and securely affixed by the owner of the building, or his duly authorized agent, in a conspicuous place in each space to which they relate. Such plates shall not be removed or defaced but, if lost, removed, or defaced, shall be replaced by the owner or his agent. 1910.22(d)(1)

It shall be unlawful to place, cause, or permit to be placed, on any floor or roof of a building or other structure, a load greater than that for which such floor or roof is approved by the building official. 1910.22(d)(2)

Every stairway floor opening shall be guarded by a standard railing. The railing shall be provided on all exposed sides (except at entrance to stairway). For infrequently used stairways where traffic across the opening prevents the use of fixed standard railing (as when located in aisle spaces, etc.), the guard shall consist of a hinged floor opening cover of standard strength and construction and removable standard railings on all exposed sides (except at entrance to stairway). 1910.23(a)(1)

Every ladder way floor opening or platform shall be guarded by a standard railing with standard toe board on all exposed sides (except at entrance to opening), with the passage through the railing either provided with a swinging gate or so offset that a person cannot walk directly into the opening. 1910.23(a)(2)

Every hatchway and chute floor opening shall be guarded by one of the following:



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- Hinged floor opening cover of standard strength and construction equipped with standard railings or permanently attached thereto so as to leave only one exposed side. When the opening is not in use, the cover shall be closed or the exposed side shall be guarded at both top and intermediate positions by removable standard railings.
- A removable railing with toe board on not more than two sides of the opening and fixed standard railings with toe boards on all other exposed sides. The removable railings shall be kept in place when the opening is not in use.
- Where operating conditions necessitate the feeding of material into any hatchway or chute opening, protection shall be provided to prevent a person from falling through the opening. [1910.23\(a\)\(3\)\(i-ii\)](#)
- Every skylight floor opening and hole shall be guarded by a standard skylight screen or a fixed standard railing on all exposed sides. [1910.23\(a\)\(4\)](#)
- Every pit and trapdoor floor opening, infrequently used, shall be guarded by a floor opening cover of standard strength and construction. While the cover is not in place, the pit or trap opening shall be constantly attended by someone or shall be protected on all exposed sides by removable standard railings. [1910.23\(a\)\(5\)](#)
- Every manhole floor opening shall be guarded by a standard manhole cover which need not be hinged in place. While the cover is not in place, the manhole opening shall be constantly attended by someone or shall be protected by removable standard railings. [1910.23\(a\)\(6\)](#)
- Every temporary floor opening shall have standard railings, or shall be constantly attended by someone. [1910.23\(a\)\(7\)](#)

Every floor hole into which persons can accidentally walk shall be guarded by either:

- A standard railing with standard toe board on all exposed sides.
- A floor hole cover of standard strength and construction. While the cover is not in place, the floor hole shall be constantly attended by someone or shall be protected by a removable standard railing. [1910.23\(a\)\(8\)\(i-ii\)](#)
- Every floor hole into which persons cannot accidentally walk (on account of fixed machinery, equipment, or walls) shall be protected by a cover that leaves no openings more than 1 inch wide. The cover shall be securely held in place to prevent tools or materials from falling through. [1910.23\(a\)\(9\)](#)
- Where doors or gates open directly on a stairway, a platform shall be provided, and the swing of the door shall not reduce the effective width to less than 20 inches. [1910.23\(a\)\(10\)](#)

Every wall opening from which there is a drop of more than 4 feet shall be guarded by one of the following: Rail, roller, picket fence, half door, or equivalent barrier.

- Where there is exposure below to falling materials, a removable toe board or the equivalent shall also be provided. When the opening is not in use for handling materials, the guard shall be kept in position regardless of a door on the opening. In addition, a grab handle shall be provided on each side of the opening with its center approximately 4 feet above floor level and of standard strength and mounting. [CFR:1910.22\(b\)\(1\)\(i-ii\)](#)
- Extension platform onto which materials can be hoisted for handling, and which shall have side rails or equivalent guards of standard specifications.
- Every chute wall opening from which there is a drop of more than 4 feet shall be guarded by one or more barriers as required by the conditions.



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- Every window wall opening at a stairway landing, floor, platform, or balcony, from which there is a drop of more than 4 feet, and where the bottom of the opening is less than 3 feet above the platform or landing, shall be guarded by standard slats, standard grill work, or standard railing.
- Where the window opening is below the landing, or platform, a standard toe board shall be provided. 1910.23(b)(3)
- Where there is a hazard of materials falling through a wall hole, and the lower edge of the near side of the hole is less than 4 inches above the floor, and the far side of the hole more than 5 feet above the next lower level, the hole shall be protected by a standard toe board, or an enclosing screen of solid construction (or as specified in paragraph (e)(11) of section 1910.23(b)(5))
- Every runway shall be guarded by a standard railing on all open sides 4 feet or more above floor or ground level. Wherever tools, machine parts, or materials are likely to be used on the runway, a toeboard shall also be provided on each exposed side.
- Runways used exclusively for special purposes (such as oiling, shafting, or filling tank cars) may have the railing on one side omitted where operating conditions necessitate such omission, providing the falling hazard is minimized by using a runway of not less than 18 inches wide. Where persons entering upon runways become thereby exposed to machinery, electrical equipment, or other danger not a falling hazard, additional guarding than is here specified may be essential for protection. 1910.23(c)(3)
- Every flight of stairs having four or more risers shall be equipped with standard stair railings or standard handrails, (as specified in paragraphs (d)(1)(i) through (v) of this section 1910.23(d)(1)) the width of the stair to be measured clear of all obstructions except handrails.
- On stairways less than 44 inches wide having both sides enclosed, at least one handrail, preferably on the right side descending.
- On stairways less than 44 inches wide having one side open, at least one stair railing on the open side.
- On stairways less than 44 inches wide having both sides open, one stair railing on each side.
- On stairways more than 44 inches wide but less than 88 inches wide, one handrail on each enclosed side and one stair railing on each open side.
- On stairways 88 or more inches wide, one handrail on each enclosed side, one stair railing on each open side, and one intermediate stair railing located approximately midway of the width.
- Winding stairs shall be equipped with a handrail offset to prevent walking on all portions of the treads having width less than 6 inches.

A standard railing shall consist of top rail, intermediate rail, and posts, and shall have a vertical height of 42 inches nominal from the upper surface of top rail to floor, platform, runway, or ramp level. The top rail shall be smooth-surfaced throughout the length of the railing. The intermediate rail shall be approximately halfway between the top rail and the floor, platform, runway, or ramp. The ends of the rails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard. 1910.23(e)(1)



Section 2: Ladders

Types of Ladders

Always choose the right type of ladder for the job. One type of ladder will not suffice for all situations. The types of ladders and their uses are as follows:

- Use a stepladder for reaching items on shelves, changing light bulbs or whenever you're trying to reach something over your head. Stepladders shall be of three types:
 - Type I – Industrial stepladder, 3 to 20 feet for heavy duty, such as utilities, contractors, and industrial use
 - Type II – Commercial stepladder, 3 to 12 feet for medium duty, such as painters, offices, and light industrial use
 - Type III – Household stepladder, 3 to 6 feet for light duty, such as light household use
- Use a straight or extension ladder when the job allows you to anchor a ladder against a sturdy surface (e.g. a wall or roof).
- Use a nonconductive fiberglass ladder in areas where electrical safety is a concern.

Guidelines

Ladders will be frequently inspected and maintained in good condition to ensure that the joints between the side rails, rungs, and steps are tight, all hardware and fittings are securely attached, and that the movable parts operate freely without binding or undue looseness.

Ladders with broken or missing rungs, broken steps, split side rails, or other faulty or defective construction shall not be used. When ladders with such defects are discovered they will be withdrawn from service, repaired, or destroyed. [1917.119\(1\)\(i-v\)](#)

Ladders shall be kept clean and free from dirt and grease which might conceal defects. Do not paint ladders.

Portable metal ladders will not be used around energized electrical equipment or near transmission lines, or where there is a chance of accidental contact with those lines. [1926.1053\(b\)\(12\)](#)

The upper end of fixed or portable ladders will extend no less than 36 inches (3 feet) above a platform floor or other landing surface. [1917.119\(f\)\(7\)](#)

Portable ladders will be equipped with non-slipping bases. The feet will be level to prevent tipping sideways. [1917.119\(f\)\(9\)](#)

Carry ladders with the front ends high enough to avoid striking anyone in front of you. Short ladders shall not be spliced to make longer ladders.

Ladders shall be placed so that the distance from the supporting surface to the base of the ladder is approximately one-fourth (1/4) of the length of the ladder to the support point.

Ladders will not be placed on boxes, barrels, or other unstable bases to obtain additional height. Be sure shoes are not greasy, muddy, or otherwise slippery before climbing ladders.

Supplies to be used at the top of the ladder shall be raised with a rope, block, and pulley, or by other means. Nothing will be carried which prevents the use of both hands in climbing or descending a ladder. Always face the ladder when climbing and descending. Use both hands to



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grip the side rails. Take ladder steps one at a time. Rings and jewelry should be removed to avoid snagging or catching on the ladder.

Reach only within safe limits. Do not reach out more than an arm's length from the side rail. Move the ladder if you cannot reach the desired work area normally.

Do not climb higher than the third rung from the top on a straight or extension ladder. Do not climb higher than the second step from the top on a stepladder. Never stand on the top rung of any ladder. 1926.1053(b)(13)

Two persons shall be used to raise a long ladder: one to brace the lower end, the other to lift the top.

Check the lock after the ladder is extended to be sure that the lock is properly seated.

Ample overlap shall be left between sections when the ladder is extended to avoid collapse because of stresses on lower sections. For two section ladders the following minimum overlaps are required:

- Up to 38 feet – three (3) feet
- 38 feet to 44 feet – four (4) feet
- 44 feet to 55 feet – five (5) feet

A ladder will not be placed in front of a doorway unless the door is locked, blocked, or guarded. 1926.1053(b)(8)

Ladders will be stowed so that they will not fall or be knocked over.

In order that defects may be readily discovered, wood ladders should not be painted but may be preserved with linseed oil, shellac, or other transparent preservatives that will not conceal the condition of the wood.

When not in use wood ladders should be stored at a location where they will not be exposed to extreme conditions of heat or moisture and where there is good ventilation. They will not be stored near radiators, stoves, steam pipes, etc.

Ladders stored in a horizontal position will be supported at a sufficient number of points to prevent sagging and permanent set.

Section 3: Scaffolds

Scaffolds are required for any work that cannot be safely done from the ground or by ladder. Front-end, loader buckets or any other equipment not designed to lift personnel shall not be used as a substitute for scaffolding or any other lifting device. 1910.28(a)(1)

All scaffolds, ladders, machinery, equipment, and devices will be inspected at frequent and regular intervals while in use. Any scaffold found damaged or weakened will not be used until replaced, or repairs have been made. 1910.28(a)(6)

Scaffolds will be constructed and maintained in conformance with Sections 1910.28 and 1910.29.

Section 4: Floors and Stairways

All floors shall be cleared of any projections such as nails, bolts, and cleats, which may be protruding. Floor openings shall be guarded by railings or barricades at exposed edges. While



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the cover is not in place, the pit or trap opening shall be constantly attended by someone, or shall be protected on all exposed sides by removable standard railings. 1910.23(a)(5)

Floors in machine shops, repair garages, and maintenance shops shall be kept free from oil and grease.

Machines and equipment shall be placed to provide adequate and safe passageways. Hand tools, jacks, carts, creepers, and drop cords shall not be left lying around on floor areas, but shall be returned to their proper place.

Stairways will be kept clear of all material. Where it is necessary and advisable, stairways will be equipped with nonskid treads.

Employees should immediately report defective handrails, stair treads, or other hazards on stairways. Broken or split treads, or other serious hazardous treads on stairways, will be properly replaced or repaired.

Every stairway of four (4) risers or more will be railed. Railings will not be less than 30 inches or more than 34 inches high, measured vertically from the upper surface of the riser, and a center rail will be installed. Railings will be maintained in a firm and secure condition. Stairways having both sides open will have a railing along each side. 1910.23(d)(1)

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Weather Hazards

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Weather Hazards

Section 1: General

It is the employee's responsibility to wear proper clothing and maintain proper physical condition in order to safely perform during dangerous weather.

It is the supervisor's responsibility to analyze weather-related conditions prior to and throughout the work day. If any weather condition(s) arise that pose serious health hazards to employees, the supervisor shall determine the necessary measures to reduce and/or eliminate those hazards. These measures can be, but are not limited to:

- Increased number of breaks
- Planned activities according to weather

Section 2: Prevention and First Aid Treatment for Weather Related Exposures

Heat Exposure

Sunburn is common during the summer. If you follow a few simple precautions, time lost to sunburn can be reduced by:

- Wearing a safety hard hat or cap.
- Wearing long sleeves and light colored clothing.
- Wearing lightweight, loose fitting clothes, except when loose fitting clothing could pose a hazard (i.e.: chipper and chain saw operation).
- Protecting exposed skin with sun block \geq SPF 30.

Beware and know the symptoms and treatment of, heat stroke, heat exhaustion, and heat cramps when involved in strenuous activity in hot environments.

	Symptom	Response
Heat Cramps	Painful muscle spasms in the legs, arms, or abdominal areas, heavy sweating.	Stop exertion and move into the shade or a cooler location. Drink sports drink, juice, or water. Gently stretch and massage muscles.



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<p>Heat Exhaustion</p>	<p>Fatigue, confusion, clammy skin, nausea, excessive sweating, weakness, headache, dizziness, thirst.</p>	<p>Move to a cool place with the legs elevated. Give sports drink, juice, or water. Remove clothing. Cool with water bath, spray, or fan. If condition does not improve, seek medical attention.</p>
<p>Heat Stroke</p>	<p>Extremely high body temperatures, hot, dry, flushed skin, fatigue, confusion, slurred speech, seizures, fast breathing and pulse, unresponsiveness.</p>	<p>Seek medical attention immediately and cool the body down as quickly as possible by immersing in water up to the neck or spraying, sponging, or showering with cool water. Place ice packs against the groin, armpits, and sides of the neck.</p>

Take time to allow your body to adjust to high heat and high humidity environments before exertion begin.

Be aware of temperature and humidity, and drink fluids with electrolytes at regular intervals.

Frostbite

When working in extreme cold, you expose yourself to frostbite. Frostbite is a great danger to the nose, cheeks, ears, toes, and fingers. Often, a victim of frostbite is not even aware of the damage being done; therefore, it is important to know the signs/symptoms and first aid treatment for frostbite.

Signs/Symptoms of Frostbite

The first sign of frostbite is reddening of the skin. It then turns blotchy white, gray, or yellow. Finally, the skin becomes completely white and blisters. The body part may feel very cold or numb. In advanced stages of frostbite, there is no feeling at all in the exposed skin.

Frostbite victims also suffer from hypothermia or loss of body heat. Some signs/symptoms include shivering, drowsiness, unresponsiveness, cold pale skin, and not caring about staying warm. Hypothermia victims need to get out of the cold immediately.



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Treating Frostbite

Get help immediately. Remove any wet clothing and apply warm packs to neck, armpits and groin. If warm packs are not available, use your own body heat to warm victim. Do not rub the affected area. Do not re-warm with direct heat.

Stay with victim and keep them warm until help arrives. If victim must be moved, do so gently, keeping the victim in the horizontal position.

Keep the victim as warm and dry as possible. Bring the victim inside to a warm place as soon as you can. Warm the frozen body part by putting it in warm (not hot) water, damp cloths or, blankets. Check the water or cloth frequently to make sure it stays warm. Do not rub or move the frozen part. Place frostbitten part lower than the heart to increase blood flow.

Get medical attention as soon as possible.

Avoiding Frostbite

Maximum protection against cold is avoided by wearing at least three layers of clothing. The first layer next to the skin should be loose fitting wool, loose twill cotton, or quilted thermal underwear. The second layer should be a medium weave, medium weight, one or two piece garment--again, not tight fitting. The outer layer should be wind-resistant and include a hood. Mittens are good protection for the hands.

Also, when working in the cold, wiggle your toes and fingers. If they are beginning to lose feeling, are tingling or painful, come inside and warm up.

Protect the eyes from the bright snow/sky combination by wearing dark colored glasses.

Be prepared to protect your lungs with a facemask or scarf when subjected to prolonged breathing of extremely cold air.

Hypothermia

When a person gets so cold that his or her body cannot warm up, it's called hypothermia. Hypothermia can be fatal, but its risks can be avoided and its effects minimized if you take precautions and use first aid quickly.

Dress warmly, stay dry, and bring along extra dry clothes when working outside in cold weather.

Mild Hypothermia	Severe Hypothermia
Shivering, loss of coordination, confusion.	No longer shivering, stumbling, irrational behavior, slow, irregular heartbeat, low body temperature.



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Heat Index Chart (Temperature & Relative Humidity)

RH (%)	Temperature (° F)															
	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
90	119	123	128	132	137	141	146	152	157	163	168	174	180	186	193	199
85	115	119	123	127	132	136	141	145	150	155	161	166	172	178	184	190
80	112	115	119	123	127	131	135	140	144	149	154	159	164	169	175	180
75	109	112	115	119	122	126	130	134	138	143	147	152	156	161	166	171
70	106	109	112	115	118	122	125	129	133	137	141	145	149	154	158	163
65	103	106	108	111	114	117	121	124	127	131	135	139	143	147	151	155
60	100	103	105	108	111	114	116	120	123	126	129	133	136	140	144	148
55	98	100	103	105	107	110	113	115	118	121	124	127	131	134	137	141
50	96	98	100	102	104	107	109	112	114	117	119	122	125	128	131	135
45	94	96	98	100	102	104	106	108	110	113	115	118	120	123	126	129
40	92	94	96	97	99	101	103	105	107	109	111	113	116	118	121	123
35	91	92	94	95	97	98	100	102	104	106	107	109	112	114	116	118
30	89	90	92	93	95	96	98	99	101	102	104	106	108	110	112	114

Note: Exposure to full sunshine can increase HI values by up to 15° F



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Wind Chill Chart - F, wind in mph													
Wind (mph)	Temperature (° F)												
	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25
5	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40
10	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47
15	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51
20	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55
25	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58
30	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60
35	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62
40	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64
<i>Wind speeds above 40 mph have little additional chilling affect</i>													

Note: In using the table above, values of wind chill below -10° F are considered bitterly cold. Values of wind chill below -20° F are extremely cold -- human flesh will begin to freeze within one minute!

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Welding, Cutting, and Brazing

Section 1: General

Certified

Defined as an employee who has obtained welding certifications through an accredited source and permitted to perform all cutting, torching, metal heating, and welding fabrications.

Qualified

An employee who has demonstrated an understanding and ability to execute cutting, torching, welding, and metal heating work practices as determined by a certified welder and approved by the supervisor.

Hot Work Permit

A permit that is issued by an employee through a supervisor when welding, cutting, torching, and metal heating is performed outside of the designated area. [1910.252\(a\)\(2\)\(iv\)](#)

Employees engaged in Oxy-Fuel operations shall be knowledgeable in such operations, and shall keep in mind the safety of fellow employees, as well as their own safety, at all times. Only Qualified employees shall use the Oxy-Fuel system. Employees can be qualified by a certified welder.

No one except a certified welder shall perform any structural welding activities.

All apparatus shall be handled strictly in accordance with the manufacturer's instructions, local and state fire codes, and recognized safe practices.

Screens, shields, or other safeguards shall be provided for the protection of persons and other materials that may be susceptible to sparks or rays from welding/cutting activities. When others must work in the area, they shall be protected from the arc rays by screens or other adequate individual protection. [1910.252\(b\)\(2\)\(iii\)](#)

All hoses, gauges, connection tanks, and leads shall be inspected before use. Defective equipment shall be repaired or replaced immediately.

Welders will warn other employees of the location of hot metals for their protection. When welding or cutting lead, zinc, cadmium-coated, lead-bearing, or other toxic materials, every effort shall be made for the removal of fumes (use of ventilation). If fumes continue to pose a health hazard, Positive Air Purifying Respirator (PAPR) shall be used if available. [1910.252©\(1\)](#)

Section 2: Fire Prevention and Protection

Basic Precautions

- Prior to the start of any hot work, a Hot Work permit found at the end of this chapter shall be filled out if not performing welding/torch activities in a designated welding bay.
- If the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity shall be taken to a safe place.
- If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards shall be used to confine the heat, sparks, and slag in order to protect the immovable fire hazards.



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- If the above requirements cannot be met, the welding and cutting shall not be performed.

Special Precautions

Suitable fire extinguishing equipment shall be maintained in a state of readiness for instant use. Such equipment may consist of pails of water, buckets of sand, hose, or portable extinguishers. The type of equipment available depends upon the nature and quantity of the combustible material exposed: [1910.252\(a\)\(2\)\(ii\)](#)

- Employee shall watch for fires for at least a one-half (1/2) hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires. [1910.252\(a\)\(2\)\(iii\)\(b\)](#)
- Cutting or welding shall not be permitted in areas not authorized by management, in the presence of explosive atmospheres, where explosive atmospheres may develop inside unclean or improperly prepared tanks, or in areas with an accumulation of combustible dusts. [1910.252\(a\)\(2\)\(vi\) "A,B,C,D"](#)
- Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings, or roofs shall not be done if the work is close enough to cause ignition by conduction. [1910.252\(a\)\(2\)\(xii\)](#)

Welding or Cutting Containers

No welding, cutting, or other hot work shall be performed on used drums, barrels, tanks, or other containers until they have been cleaned thoroughly as to make absolutely certain that there are no flammable materials present. Any pipe lines or connections to the drum or vessel shall be disconnected or blanked [1910.252\(a\)\(3\)\(i\)](#)

Section 3: Protection of Personnel

A welder or helper working on platforms, scaffolds, or runways 4' above lower level shall be protected against falling through the use of railings, harnesses, life lines, or some equally effective safeguards. [1910.252\(b\)\(1\)\(i\)](#)

Personal Protective Equipment

Appropriate protective clothing is required for all welding operations and will vary with the size, nature and location of the work to be performed. Some suggested protective measures for welders and helpers are:

- Flame-resistant gauntlet gloves, aprons, jackets, trousers, or other protective garments shall be used as protection against heat and sparks.
- Clothing will be free of oil and grease. Shirts should have full sleeves, no pockets, and should be worn outside of trousers with the collar buttoned. Trousers should have no cuffs and extend well down to the safety shoe.
- High-quality welding helmets of glass fiber, vulcanized fiber, chromed leather, or other suitable material should be worn. Hand shields are generally substituted for helmets on light, intermittent work. Employees assisting welders will also wear protective lenses to protect eyes.
- Safety goggles or glasses shall be worn during chipping and cleaning.

Welding in Confined Spaces

Confined spaces are dangerous enough without the added danger of welding. Always consult your District Safety Director to determine whether or not welding and/or entry should be



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attempted in confined spaces. Once permission is given and procedures are followed, below are recommended steps: 1910.252(b)(4)

- All welding and cutting operations that are performed in confined spaces shall be adequately ventilated. If it is impossible to provide such ventilation, PAPR for this purpose shall be used.
- When welding or cutting is being performed in any confined space, the gas cylinders and welding machines shall be left on the outside. 1910.252(b)(4)(iii)
- When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine shall be disconnected from the power source.
- Where welders must enter a confined space through a manhole or other small opening a method shall be provided for quickly removing them in case of an emergency. An attendant with a preplanned rescue procedure shall be stationed outside to observe the welder at all times and be capable of beginning rescue operations.
- Torch valves shall be closed and the fuel and oxygen supply to the torch positively shut off at some point outside the confined area whenever the torch is not being used for a substantial period of time, such as lunch or overnight. Where practical, the torch and hose shall also be removed from the space.

Section 4: Arc Welding

Welding Equipment

Only standard electric arc-welding equipment such as generators, motor-generator units, transformers, rectifiers, etc., conforming to the requirements of the National Electrical Manufacturers' Association or the Underwriters' Laboratories, Inc. will be used.

Power circuits will be installed and maintained in accordance with the National Electrical Code. Check the voltage for which the machine is wired before connecting.

Electrode and ground cables will be supported so as not to create obstructions interfering with the safe passage of employees. 1910.252(b)(1)(ii) The ground lead for the welding circuit will be mechanically strong and electrically adequate for the service required. An electrode holder of adequate rated current capacity, insulated against shock, shorting, or flashing when laid on grounded material, will be used. 1910.254(c)(2)(v)

Operation and Maintenance

Before starting operations, all connections to the machine shall be checked to make certain that they are properly made.

There shall be no leaks of cooling water, shielding gas or engine fuel. Report any equipment defects or safety hazards to your supervisor and discontinue the use of the equipment. 1910.254(d)(4)

Machines that have become wet shall be thoroughly dried and tested before being used.

Cables with splices within 10 feet of the holder shall not be used. Welders should not coil or loop welding electrode cable around parts of their body.

Cables with damaged insulation or exposed bare conductors shall be replaced.



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All foot switches shall be guarded to prevent accidental operation of the machine.

Section 5: Gas Welding and Cutting

Use only approved welding and cutting equipment. Flash arrest valves shall be used on both hoses. Some flash arrestors are installed within the head of the torch, check manufacture for details. Avoid oil contamination of gauge connections. Welding and cutting equipment will never be left unattended with the valves in the open position. All compressed gas Cylinders shall be chained or securely fastened at all times. Personal protective equipment requirements identified in Section 3 of this chapter also apply to gas welding and cutting. 1910.253(e)(3)(ii)(b), 1910.253(e)(3)(ii)(c)(3)

Storing Cylinders

Compressed gas cylinders will be kept away from excessive heat and are not to be stored where they might be damaged or knocked over and will be stored at least 20 feet away from highly combustible materials. Where cylinders are designed to have a valve protection cap, the cap will be in place except when the cylinder is connected for use. Safety caps will always be in place when cylinders are being transported in a vehicle. 1910.253(b)(2)

Compressed gas cylinders will be stored in a vertical valve-end-up position and shielded from the direct rays of the sun and protected from accumulations of ice and snow. 1910.253(b)(3)(ii)

Oxygen cylinders shall be stored separately from gas fuel cylinders or combustible materials by a minimum distance of 20 feet or by a noncombustible barrier at least five (5) feet high. All compressed gas cylinders and storage areas must be properly labeled. 1910.253(b)(4)(iii)

Cylinders shall be carefully stored so as to avoid possible destruction or obliteration of coloring, tags and other means of identifying the contents. 1910.253(b)(1)(ii)

Empty cylinders shall have their valves closed and capped. 1910.253(b)(5)(ii)(H)

Using Cylinders

Cylinders will be placed in a rack, chained, or otherwise positively secured against tipping over when stored. They will be used in the order received from the supplier. When empty, the valve shall be closed, capped, and cylinder stored accordingly.

Before connecting a regulator to a cylinder valve, the valve shall be opened slightly and closed immediately to purge any debris from valve. The valve shall be opened while standing to one side of the outlet; never in front of it.

Compressed gas cylinder valves shall not be opened more than half ($\frac{1}{2}$) turns and preferably no more than three fourths ($\frac{3}{4}$) of a turn.

Keep cylinders from contact with electric wires and shield them from sparks or flame from welding and cutting.

Do not allow storing of tools, materials, or anything else on top of cylinders. While in use the valve key will be kept in place on the valve spindle.

Cylinders shall be kept free from oily or greasy substances.

A hammer or wrench shall not be used to open cylinder valves.



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Handling and Transporting Cylinders

Whenever a cylinder is being transported, remove the regulator and be sure that the valve protection cap is in place. Never use valves or caps for lifting. For raising or lowering use a suitable sling, boat, cradle, or platform. Always handle carefully, do not drop or jar. Cylinders should be moved by tilting and rolling on the bottom edge, do not drag or slide. When moving with a truck, be sure that the cylinders are securely held in place in an upright position.

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