

The **ABCs** of construction site safety



A Division of the
Department of Consumer
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On the cover: Crane operator

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About this guide

This guide consists of 28 “A-to-Z” workplace safety topics for construction-industry employers. Most topics include key construction-industry rules and summarize what you need to do to comply. If you are looking for a primer on our workplace safety and health rules for the construction industry, this guide is a good place to start. It does not cover all of our construction rules but most topics include links to related rules and other important information so that you can learn more.

Need more information or help?

- Oregon OSHA offers a variety of services including confidential, free safety, health, and ergonomic consultations in addition to no-cost workshops. Oregon OSHA’s enforcement officers also provide pre-job conferences for construction companies.
- Oregon OSHA’s [program directives](#) and [interpretations](#) offer additional guidance for complying with Oregon OSHA rules.
- Oregon OSHA’s [Resource Center](#) has a large selection of books and periodicals as well as the American National Standards Institute (ANSI) and other consensus standards; the staff can provide technical and research assistance. The Resource Center also has an audiovisual library covering vehicle safety, respiratory health, toxic materials, hazard communication, ergonomics, hearing conservation, asbestos, general safety, industrial hygiene, accident investigation, confined work spaces, bloodborne pathogens, safety committees, construction, and more.
- The [Resource newsletter](#) focuses on safe work practices and news you can use to make your workplace safer and healthier. You can [subscribe](#) and sign up online.

This guide

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Questions or comments? We'd like to hear from you.

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Accident prevention and accident investigation

Accident prevention responsibilities – Division 3, Subdivision C, 1926.20(b)

It is the employer's responsibility to maintain programs that comply with Oregon OSHA's construction rules.

- Such programs must provide for frequent and regular inspections of the job sites, materials, and equipment by competent persons designated by the employer.
- Use of machinery, tools, material, or equipment that does not comply with applicable requirements of this rule is prohibited. Machines, tools, material, or equipment must be identified as unsafe by tagging or locking the controls to make them inoperable or must be physically removed from the place of operation.
- The employer must permit only those employees qualified by training or experience to operate machinery or equipment.

Employer responsibilities – Division 1, 437-001-0760(1)

The employer must ensure that employees are properly instructed and supervised in the safe operation of any machinery, tools, equipment, process, or practice that they are authorized to use.

The employer must take all reasonable means to require employees:

- To work and act in a safe and healthful manner
- To conduct their work in compliance with all applicable safety and health rules



- To use all means and methods that are necessary to safely accomplish all work where employees are exposed to a hazard
- Not to remove, displace, damage, destroy, or carry off any safety device, guard, notice, or warning provided for use in any employment or place of employment when such use is required by applicable safety and health rules

Investigations of injuries – Division 1, 437-001-0760(3)

The employer must investigate every lost-time injury to determine the means that should be taken to prevent recurrence. The employer must promptly install any safeguard or take any corrective measure indicated or found advisable.

Supervisors or people in charge of work are agents of the employer in the discharge of their authorized duties and are at all times responsible for:

- The execution in a safe manner of the work under their supervision
- The safe conduct of their crew while under their supervision
- The safety of all employees under their supervision



Barricades and other traffic controls

Traffic control – Division 3, Subdivision G, 437-003-0420

- Adequate, appropriate traffic controls must be provided for all operations on or adjacent to a highway, street, or roadway. The traffic controls must conform to the Millennium Edition of the (FHWA) Manual on Uniform Traffic Control Devices ([MUTCD](#)), December 2000.
- Barricades for protection of employees must conform to the Millennium Edition of the (FHWA) Manual on Uniform Traffic Control Devices ([MUTCD](#)), December 2000.

Note: Employers can use the most current edition of the MUTCD.

- Signaling by flaggers and the use of flaggers, including warning garments worn by flaggers, must also conform to the Millennium Edition of the (FHWA) Manual on Uniform Traffic Control Devices ([MUTCD](#)), December 2000.

Note: Flagger's warning garments must conform to the MUTCD. Construction employees, other than flaggers, exposed to highway type moving vehicles in construction zones and street/highway traffic must wear highly visible upper body garments that comply with 437-003-0134(7).

Vehicle drivers and riders – Division 3, Subdivision O, 437-003-3224(12)

- Traffic control: Employees must set up appropriate traffic controls when they stop on or adjacent to a highway, street, or road in a way that creates a hazard and when traffic cannot adjust safely on its own. The controls must conform to the Millennium Edition of the Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices ([MUTCD](#)), December 2000.
- Employers who follow the most current edition of the [Oregon Temporary Traffic Control Handbook for Operations of Three Days or Less](#) comply with this requirement.



C**hemicals**

Hazard communication – Division 3, Subdivision D, 1926.59

Employers must prepare a hazard communication program if their employees use or may be exposed to hazardous chemicals. The purpose of the hazard communication rule is to ensure that all hazardous chemicals are evaluated and employees get the information by a hazard communication program.

The hazard communication rule applies to any hazardous chemical in which employees may be exposed under normal conditions of use, or in a foreseeable emergency. A “hazardous chemical” is any chemical that presents a physical or health hazard.

Health hazards produce acute or chronic health effects and include carcinogens, toxic agents, irritants, corrosives, and sensitizers. Physical hazards include compressed gases, explosives, flammables, organic peroxides, oxidizers, and unstable (reactive) agents.

Contractors’ employees must also be informed about the hazardous chemicals they may be exposed to. The written hazard communication program must include the methods the employer will use to provide contractors’ employees on-site access to safety data sheets (SDS); the methods to inform them of any precautionary measures; and methods to inform other employees of the labeling system used in the workplace.

The employer must ensure that each container of hazardous chemicals in the workplace is labeled, tagged, or marked to identify the hazardous chemicals and appropriate hazard warnings.



What do you think is in this bottle?

Employees need to understand the information provided by the pictograms, signal word, hazard statement, and precautionary statements on the container label provided by the chemical manufacturer, importer, or distributor.

The employer must maintain copies of the required SDS for each hazardous chemical, and must ensure that they are readily accessible during each work shift by employees when they are in their work areas. When employees must travel between workplaces during a work shift, the SDS may be kept at the primary workplace facility; however, the employer must ensure that employees can immediately obtain the required information in an emergency.

Questions that an employer needs to consider

- Where do you keep your SDSs?
- If they are in someone's office, how do you ensure information access when that person is unavailable, sick, or on vacation?
- How do you ensure access after normal working hours, weekends, or holidays?
- If you have more than one shift, do all employees on all shifts have the same access?
- How do you maintain access to employee exposure and medical records? Subdivision C, 1926.33



Confined Spaces

Confined spaces – Division 2, Subdivision J, OAR 437-002-0146

(applies to both general industry and construction employers)

When workers enter a confined space to do construction work, they can encounter toxic gases, corrosive chemicals, flammable solvents, or machines that start unexpectedly. If something goes wrong, a confined space can be difficult or impossible to exit. And would-be rescuers can share the fate of those they are trying to rescue.

Key sections of OAR 437-002-0146 include:

- Evaluation, 437-002-0146(4)
- Permit-required confined space entry programs and permits, 437-002-0146(5)
- Permit entry, 437-002-0146(6)
- Equipment, 437-002-0146(7)
- Personnel, 437-002-0146(8)
- Rescue, 437-002-0146(9)
- Alternate entry, 437-002-0146(10)
- Training, 437-002-0146(11)
- Multi-employer worksites, 437-002-0146(12)
- Records, 437-002-0146(13)

Evaluation – Division 2, Subdivision J, OAR 437-002-0146(4)

It is the employer's responsibility to determine if any of their confined spaces are permit-required confined spaces. Employers must prohibit employees from entering unevaluated confined spaces until it is fully evaluated. Effective measures to prevent unauthorized employees from entering permit spaces must be taken.

Permit-required confined space entry program and permits – Division 2, Subdivision J, OAR 437-002-0146(5)

Employers must develop and implement a written program that describes the means, practices, and procedures for employees to safely identify and enter permit spaces.

Rescue – Division 2, Subdivision J, OAR 437-002-0146(9)

It is the employer's responsibility, before employees enter a permit space, to develop and implement procedures to remove entrants in the event of an emergency or when they are unable to evacuate without outside assistance.

Training - Division 2, Subdivision J, OAR 437-002-0146(11)

Employers must train each employee involved in permit space activities so they have the understanding, knowledge, and skills necessary to safely perform their duties, according to their assigned responsibilities.



CC: Cranes

Cranes and derricks — Division 3, Subdivision CC

This rule covers requirements for the safe use of cranes and derricks used in construction. Some key sections in Subdivision CC include:

- Scope, 1926.1400
- Ground conditions, 1926.1402
- Assembly/disassembly – general requirements, 1926.1404
- Power line safety (up to 350 kV) – equipment operations, 1926.1408
- Inspections, 1926.1412
- Operation, 1926.1417
- Authority to stop operation, 1926.1418
- Training, 1926.1430
- Hoisting personnel, 1926.1431

Assembly/disassembly requirements covered in 1926.1404 include:

- Manufacturer prohibitions
- Manufacturer assembly/disassembly procedure
- Employer assembly/disassembly procedure



Inspection requirements covered in 1926.1412 include:

- Repaired/adjusted equipment, 1926.1412(b)
- Post assemble
- Each shift
- Monthly
- Annual comprehensive

Operation requirements covered in 1926.1417 include:

- Operation procedures, 1926.1417(b)
- Leaving the equipment unattended, 1926.1417(e)
- Capacity, 1926.1417(o)

Training requirements covered in 1926.1430 include:

- Overhead power lines, 1926.1430(a)
- Signal persons, 1926.1430(b)
- Operators, 1926.1430(c)



Division 3 – construction rules

Division 3, which includes all of Oregon OSHA's safety and health rules for the construction industry, has the following subdivisions:

- C: General Safety and Health Provisions
- CC: Cranes and Derricks in Construction
- D: Occupational Health and Environmental Controls
- E: Personal Protective and Life Saving Equipment
- F: Fire Protection and Prevention
- G: Signs, Signals, and Barricades
- H: Materials Handling, Storage, Use, and Disposal
- I: Tools – Hand and Power
- J: Welding and Cutting
- K: Electrical
- L: Scaffolding
- M: Fall Protection
- N: Helicopters, Hoists, Elevators, and Conveyors
- O: Motor Vehicles, Mechanized Equipment, and Marine Operations
- P: Excavations
- Q: Concrete and Masonry Construction
- R: Steel Erection
- S: Underground Construction, Caissons, Cofferdams, and Compressed Air
- T: Demolition
- U: Blasting and Use of Explosives
- V: Power Transmission and Distribution
- W: Rollover Protective Structures; Overhead Protection
- X: Stairways and Ladders
- Z: Toxic and Hazardous Substances

Oregon OSHA also has [program directives](#) and [interpretations](#) of its rules.

Note: When a specific type of equipment, process, or practice is *not* limited to the construction industry, the provisions in other Oregon OSHA divisions will apply. See OAR 437-003-0005, *Additional Applicability*.



Standards and rules are available online at www.orosha.org.

Electrical

Oregon OSHA's electrical requirements for the construction industry are in Division 3, **Subdivision K** and include the following sections:

- General requirements
- Installation safety requirements
- Safety-related work practices (including lockout/tagout)
- Safety-related maintenance and environmental considerations
- Safety requirements for special equipment

Branch circuits – Division 3, Subdivision K, 437-003-0404

- All 125-volt, single-phase, 15-, 20-, and 30-ampere receptacles on construction sites that are for temporary power and are available for use by employees, must have approved ground-fault circuit interrupters (GFCIs).
- GFCI protection must be at the outlet end of the circuit. Extension cords or other devices with listed ground-fault circuit interrupter protection for personnel identified for portable are acceptable.
- Receptacles more than 125-volt, single phase, 30-amperes must have protection that complies with GFCI protection above, or an assured equipment grounding conductor program.



Typical “Spider box” supplies GFCI-protected receptacle for use on construction sites.

Working near overhead high-voltage lines and equipment – Division 3, Subdivision K, 437-003-0047

Do not enter or perform any activity (such as handling, erecting, operating, transporting, or storing any tools, equipment, or materials, moving a building or structure) within the restricted space surrounding an overhead high-voltage line or equipment unless:

- You are the owner, an authorized employee, or authorized (in writing) agent of the overhead high voltage system.
- Proper notification is provided and the line and equipment is de-energized and visibly grounded by the owner of the high-voltage system or authorized agent, or accidental contact is prevented by use of insulating barriers or guards.
- Insulated lines (not tree wire) and equipment designed and engineered to allow only incidental contact are installed by the owner of the high-voltage system or authorized agent.

Restricted space

- For lines rated more than 600 V to 50 kV, restricted space extends 10 feet in all directions from the surface of the line or equipment.
- For lines rated over 50 kV, restricted space extends 10 feet plus 0.4 inch for each one kV over 50 kV, or twice the length of the insulator (but never less than 10 feet) in all directions from the surface of the line or equipment.
- For equipment or structures in transit, on level surfaces, restricted space extends four feet in all directions from lines or equipment rated 50 kV or less, 10 feet in all directions for lines or equipment rated over 50 kV, and 16 feet in all directions for lines or equipment rated over 345 kV up to and including 750 kV.

Fall Protection

Oregon OSHA's fall protection requirements for the construction industry are in Division 3, **Subdivision M**, and include the following sections:

- Scope, application, and definitions, 1926.500
- Duty to have fall protection (general fall protection), 437-003-1501
- Fall protection systems criteria and practices, 1926.502, 437-003-0502, 437-003- 1502, and 437-003-2502.
- Training requirements, 437-003-0503

General fall protection – Division 3, **Subdivision M**, 437-003-1501

Except where permitted by another standard, when employees are exposed to a hazard of falling 6 feet or more to a lower level, the employer must ensure that fall protection systems are provided, installed, and implemented according to the criteria in 1926.502, 437-003-0502, 437-003- 1502, and 437-003-2502. In addition, each employee working less than 6 feet above dangerous equipment must be protected from falls into or onto dangerous equipment by guardrail systems or equipment guards.

Holes: Each employee on walking/working surfaces must be protected from falling through holes (including skylights) more than six feet above lower levels. Each employee on a walking/working surface must be protected from objects falling through holes (including skylights) and from tripping in or stepping into holes (including skylights) **by covers**.

Wall openings: Each employee working on, at, above, or near wall openings (including those with chutes attached) where the outside bottom edge of the wall opening is six feet or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches above the walking/working surface, must be protected from falling.

Established floors, mezzanines, balconies, and walkways: Each employee on established floors, mezzanines, balconies, and walkways, with an unprotected side or edge six feet or more above a lower level, must be protected from falling.

Excavations: Each employee at the edge of an excavation six feet or more in depth must be protected from falling when the excavations are not readily seen because of plant growth or other visual barrier. Each employee at the edge of a well, pit, shaft, and similar excavation six feet or more in depth must be protected from falling.

Each employee must be protected from falls into or onto dangerous equipment, regardless of the fall distance.

When an employee is exposed to falling objects, the employer must have each employee wear a hard hat and must implement an additional measure of protection such as erecting toeboards, screens, or guardrail systems; erecting a canopy structure; or barricading the area and prohibiting employees from entering the barricaded area.



Although he is wearing a harness, wouldn't you want to look at the rest of his fall protection system?

Guarding

Oregon OSHA's equipment guarding requirements for the construction industry are in Division 3, **Subdivision I** and include the following sections:

- General requirements, 1926.300
- Hand tools, 1926.301
- Power-operated hand tools, 1926.302
- Powder-actuated tools, 437-003-0925
- Abrasive wheels and tools, 1926.303
- Woodworking tools, 1926.304
- Jacks – lever and ratchet, screw, and hydraulic, 1926.305

Condition of tools: All hand and power tools and similar equipment, whether furnished by the employer or the employee, must be maintained in a safe condition.

Guarding: When power-operated tools are designed to accommodate guards, they must be equipped with guards when in use. Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or moving parts of equipment must be guarded if employees could contact them.

Types of guarding: One or more methods of machine guarding must be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips, and sparks.

Guarding abrasive wheel machinery requirements are in Division 3, **Subdivision I**, 1926.303.



Health hazards

Oregon OSHA's requirements covering construction-industry health hazards are in Division 3, **Subdivision D** and include the following sections:

- Medical services and first aid, [1926.50](#)
- Sanitation, [1926.51](#)
- Drinking water, [437-003-0015](#)
- Toilets, [437-003-0020](#)
- Occupational noise exposure, [1926.52](#)
- Ionizing radiation, [1926.53](#)
- Non-ionizing radiation, [1926.54](#)
- Illumination, [1926.56](#)
- Ventilation, [1926.57](#)
- Hazard communication, [1926.59](#)
- Methylenedianiline (MDA), [1926.60](#)
- Lead, [1926.62](#)

Toxic and hazardous substances

Requirements covering toxic and hazardous substances are in **Division 3, Subdivision Z** and include:

- Air contaminants, [437-003-1000](#)
- Asbestos, [1926.1101](#)
- Chromium, [1926.1126](#)
- Cadmium, [1926.1127](#)
- Methylene Chloride, [1926.1152](#)



Make sure you stay hydrated when working in the heat. (WGN Blog)



Silica is not just dust. It is hazardous to your health.

Safety training and education – Division 3, Subdivision C, 1926.21(b)

- Employees required to handle or use poisons, caustics, and other harmful substances must be instructed about safe handling and use and be made aware of the potential hazards, personal hygiene, and personal protective measures required.
- At job sites where harmful plants or animals are present, employees who may be exposed must be instructed about the potential hazards, how to avoid injury, and the first-aid procedures in the event of injury.
- Employees handling or using flammable liquids, gases, or toxic materials must be instructed in the safe handling and use of these materials and made aware of other specific requirements in Division 3, **Subdivision C**.



Whether it is toxic adhesives, asbestos, silica, lead, or countless other occupational health dangers, employees must be instructed on the hazards and control measures.

Employer's responsibilities – Division 1, 437-001-0760(1)

- The employer is responsible for providing controls necessary to protect employees' health from harmful or hazardous conditions and for maintaining such controls in good working order.
- Every employer must inform the employees regarding the known health hazards to which they are exposed, the measures that have been taken for the prevention and control of such hazards, and the proper methods for using such controls.



Inspections

Oregon OSHA rules that have requirements for workplace inspections include:

Safety training and education – Division 3, Subdivision C, 1926.21(b)

The employer must instruct each employee how to recognize and avoid unsafe conditions and about any Oregon OSHA regulations applicable to his work.

Accident prevention responsibilities – Division 3, Subdivision C, 1926.20(b)

It is the employer's responsibility to initiate and maintain programs necessary to comply with 1926.20(b). Such programs must provide for frequent and regular inspections of the job sites, materials, and equipment to be made by competent persons designated by the employers.

Use of any machinery, tool, material, or equipment that does not comply with applicable Division 3 requirements is prohibited. The machine, tool, material, or equipment must either be identified as unsafe by tagging or locking the controls to make them inoperable or must be physically removed from its place of operation.

The employer must only permit employees qualified by training or experience to operate equipment and machinery.

Safety committees – Division 1, 437-001-0765(7)

Employers who have safety committees must establish procedures for conducting workplace safety and health inspections. People trained in hazard identification must conduct the inspections.

Inspections must be conducted quarterly at primary fixed locations, office environments, and satellite locations. Inspections at mobile work locations, infrequently visited sites, and sites that do not lend themselves to quarterly inspections, must be conducted as often as the safety committee determines is necessary.



Should this worker begin his inspection at his hard hat?
(Source: Paul A. Anderson, Cal/OSHA Hazard Compliance Unit-North)

Job Hazard Analysis

Job hazard analysis – or JHA – is an industry best practice method of identifying, assessing, and controlling hazards associated with a specific job. A JHA breaks a job down into tasks; each task is evaluated to determine if there is a better, safer way to do it. A job-hazard analysis works well for jobs with difficult-to-control hazards and jobs with histories of accidents or near misses. JHAs for complex jobs can take a considerable amount of time and expertise to develop. You may want to enlist the help of a safety professional for such tasks.

Most Oregon OSHA rules do not specifically require a JHA. However, employers are required to take the necessary steps to ensure that jobs are safe and healthful. A JHA helps fulfill this requirement. Employers applying for Oregon OSHA's Safety and Health Achievement Recognition Program ([SHARP](#)) and the Voluntary Protection Program ([VPP](#)) conduct JHAs.

Key steps in a JHA:

- Prepare: Review accident histories, involve employees, conduct risk assessment, and prioritize jobs based on hazardous exposures. Often, jobs need to be broken into tasks to better analyze the steps involved.
- Observe the task and list the steps required to accomplish it.
- Identify hazards in each step.
- Another hazard tracking method is categorizing into the following types: struck-by, struck-against, contact-by, contact-with, caught-on, caught-in, caught-between, fall-to-surface, fall-to-below, overexertion, bodily reaction, and overexposure.
- Develop hazard controls (engineering controls, management controls, PPE, and/or interim measures).
- Write a safe job procedure.

JOB HAZARD ANALYSIS		
JOB NAME:		
CONSTRUCTION PHASE:		
START DATE:		PAGE 1 OF
OPERATION	HAZARD	ACTION TO BE TAKEN

Compliments of Howard S. Wright Constructors

Keepp the site clean

General safety and health provisions – Division 3, Subdivision C, 1926.20

Contractor requirements: No contractor or subcontractor for any part of the contract work can require any laborer or mechanic employed in the performance of the contract to work in surroundings or under working conditions that are unsanitary, hazardous, or dangerous to their health or safety.

Housekeeping – Division 3, Subdivision C, 1926.25

- During the construction, alteration, or repair work, forms and scrap lumber with protruding nails and all other debris must be cleared from work areas, passageways, and stairs in and around buildings or other structures.
- Combustible scrap and debris must be removed at regular intervals during the course of construction. A safe means must be provided for removal.
- Containers must be provided for the collection and separation of waste, trash, oily and used rags, and other refuse. Containers used for garbage and other oily, flammable, or hazardous wastes, such as caustics, acids, harmful dusts, etc., must be equipped with covers. Garbage and other waste must be disposed of at frequent, regular intervals.

Sanitation – Division 3, Subdivision D, 1926.51

Sanitation requirements for construction sites in 1926.51 cover:

- Potable water, 1926.51(a)
- Nonpotable water, 1926.51(b)
- Drinking water, 437-003-0015
- Toilets at construction jobsites, 1926.51(c)

See also Oregon OSHA program directive **A-97**, Toilet facilities: reasonable accessibility

General requirements for storage – Division 3, Subdivision H, 1926.250(a)

- All materials stored in tiers must be stacked, racked, blocked, interlocked, or secured to prevent sliding, falling, or collapse.
- Maximum safe load limits of floors within buildings and structures, in pounds per square foot, must be conspicuously posted in all storage areas, except for floor or slab on grade. Maximum safe loads must not be exceeded.
- Aisles and passageways must be kept clear to provide for the free and safe movement of material handling equipment or employees. Such areas must be kept in good repair.



Any issues here?

Housekeeping: Storage areas must be kept free from materials that constitute tripping, fire, explosion hazards, or harbor pests. Vegetation must also be controlled when necessary.

Ladders and stairways

Oregon OSHA's construction requirements covering ladders and stairways are in Division 3, **Subdivision X**, and include the following sections:

- Scope, application, and definitions, 1926.1050
- General requirements, 1926.1051
- Stairways, 1926.1052
- Ladders, 1926.1053
- Extension ladders, 437-003-0065
- Training requirements, 1926.1060

Training requirements – Division 3, Subdivision X, 1926.1060

The employer must provide a training program for each employee using ladders or stairways. The program must enable each employee to recognize ladder and stairway hazards and must train each employee how to minimize the hazards.

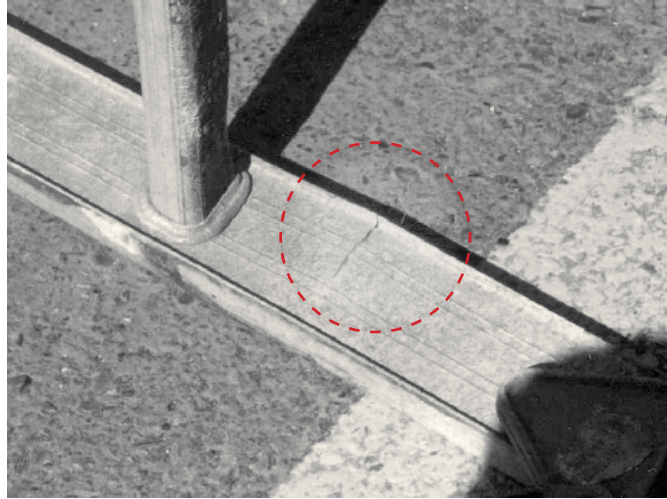
The employer must ensure that each employee has been trained by a competent person in the following areas:

- The nature of fall hazards in the work area
- The correct procedures for erecting, maintaining, and disassembling the fall protection systems to be used
- The proper construction, use, placement, and care in handling of all stairways and ladders
- The maximum intended load-carrying capacities of ladders used
- The requirements in Division 3, **Subdivision X**

Retraining must be provided for each employee as necessary.

Ladder safety essentials include:

- Appropriate selection
- Regular inspection
- Proper setup
- Safe use
- Proper maintenance and storage
- Training



Pre-use inspections are critical. Do you see the small fracture in this picture?

Medical and first aid

First aid and medical attention – Division 3, Subdivision C, 1926.23

First-aid services and provisions for medical care must be made available by the employer for every employee covered by these requirements.

Medical services and first aid – Division 3, Subdivision D, 1926.50

Key requirements:

- The employer must ensure the availability of medical personnel for advice and consultation on matters of occupational health.
- Provisions must be made for prompt medical attention in case of serious injury before commencement of a project.
- In the absence of an infirmary, clinic, hospital, or physician reasonably accessible to the worksite, a person who has a valid certificate in first-aid training from the U.S. Bureau of Mines, the American Red Cross, or equivalent training, must be available at the site to render first aid.



- First-aid supplies must be easily accessible when required. The contents of the first-aid kit must be placed in a weatherproof container with individual sealed packages for each type of item, and must be checked by the employer before being sent out on each job and at least weekly on each job to ensure that the expended items are replaced.
- Proper equipment for prompt transportation of the injured person to a physician or hospital, or a communication system for contacting necessary ambulance service, must be provided.
- Where 911 services are not available, the phone numbers of the physicians, hospitals, or ambulances must be conspicuously posted.

Appendix A to 1926.50, First-aid kits (Non-mandatory), includes the following points:

- Employers should evaluate the need for additional first-aid kits at the worksite, including additional first-aid equipment and supplies.
- Employers, who have unique or changing first-aid needs in their workplace, may need to enhance their first-aid kits. Advice from the local fire or rescue department or medical professionals may be helpful.
- If employees may be exposed to blood or other potentially infectious materials while using first-aid supplies, employers must provide personal protective equipment such as gloves, gowns, face shields, masks, and eye protection.

Note: Employers with employees in the construction industry who have occupational exposure to blood or other potentially infectious materials must follow the requirements in Division 2, Subdivision Z, 1910.1030 *Bloodborne Pathogens*.

Noise

Occupational noise exposure – Division 3, Subdivision D, 1926.52 and 437-003-0027

Whenever an employee is exposed to noise at a construction site, the requirements of Division 2, Subdivision G, Occupational Noise Exposure, 1910.95 apply. These requirements cover:

- Permissible exposure limits
- Hearing conservation program, 1910.95(c)
- Monitoring, 1910.95(d)
- Employee notification, 1910.95(e)
- Observation of monitoring, 1910.95(f)
- Audiometric testing, 1910.95(g)
- Hearing protectors, 1910.95(i)
- Hearing protector attenuation, 1910.95(j)
- Training program, 1910.95(k)
- Access to information and training materials, 1910.95(l)
- Recordkeeping, 1910.95(m)

Hours per day	Sound level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.25 or less	115

Employers must have a hearing conservation program whenever employee noise exposures equal or exceed an eight-hour time-weighted average sound level (TWA) of 85 dBA.

When employees are exposed to sound levels exceeding those listed in the table on the facing page, administrative or engineering controls must be used.



Concrete cutting is often around 110 to 115 dBA.

rganize a safety committee or hold safety meetings

Safety committees and safety meetings – Division 1, 437-001-0765

The purpose of safety committees and safety meetings is to bring employees and management together in a non-adversarial, cooperative effort to promote workplace safety and health. Safety committees and safety meetings will assist you make continuous improvement to your safety and health programs.

If more than half of your employees report to construction sites, you can have a safety committee or hold safety meetings.

Safety meetings must:

- Include all available employees
- Include at least one employer representative authorized to ensure correction of safety and health issues
- Be held on company time and attendees paid at their regular rate of pay

Safety meetings must occur at least monthly and before the start of each job that lasts more than one week.

Safety meetings must include discussions of:

- Safety and health issues
- Accident investigations, causes, and the suggested corrective measures

Employers in construction, utility work, and manufacturing must document, make available to all employees, and keep for three years a written record of each meeting that includes the following:

- Hazards related to tools, equipment, work environment, and unsafe work practices identified and discussed during the meeting
- The date of the meeting
- The names of those attending the meeting

If you are a subcontractor on a multi-employer worksite, your employees may attend the

prime contractor's safety meetings. You may keep the minutes from these meetings as a part of your records. If you choose this option, you must still meet to discuss accidents involving your employees.



Personal protective equipment (PPE)

Personal protective equipment – Division 3, Subdivision E, 437-003-0134

The employer is responsible for requiring employees to wear appropriate PPE in all operations where there is an exposure to hazards or where this requirement indicates the need for using such equipment.

Personal protective and life saving equipment – Division 3, Subdivision E

This rule covers requirements for the use, selection, and maintenance of PPE and lifesaving equipment, including:

- Payment for protective equipment, 437-003-0134(4)
- Head protection, 437-003-0134(9)
- Eye and face protection, 437-003-0134(8)
- Respiratory protection, 1926.103
- Working over or near water, 1926.106
- Foot protection, 437-003-0134(10)

Head protection – Division 3, Subdivision E, 437-003-0134(9)

- Employees working in areas where there is a danger of head injury from impact, falling or flying objects, or electrical shock and burns must be protected by hard hats.
- Hard hats must meet the specifications contained in American National Standards Institute, Z89.1, Safety Requirements for Industrial Head Protection.

High-visibility garments – Division 3, Subdivision E, 437-003-0134(7)

Employees, other than flaggers, exposed to hazards caused by on-highway type moving vehicles in construction zones and highway traffic must wear highly visible upper body garments. The colors must contrast with other colors in the area to make the worker stand out. Colors equivalent to strong red, strong orange, strong yellow, strong yellow-green, or fluorescent versions of these colors are acceptable. During hours of darkness, the garments must also have reflective material visible from all sides for 1,000 feet.

Note: High visibility garments for **flaggers** must meet the requirements in Division 3, **Subdivision G**, 437-003-0420(2).



Personal protective equipment (PPE) – *continued*

Respiratory Protection – Division 3, Subdivision E, 1926.103

Construction work can certainly produce an assortment of harmful dust, gas, fumes, mist, smoke, and vapor. In order to protect your health, effective engineering and work practice controls such as ventilation, wet methods, and confinement of the task must be established. However, if these measures are not feasible, or not protective enough, appropriate respirators must be used.

When respirators are required, a written program must be implemented covering many important elements such as respirator selection procedures, fit testing for tight-fitting respirators, maintenance protocol, medical evaluations, and training. The employer must also designate a program administrator to oversee the respiratory protection program and conduct required evaluations. Please refer to 1926.103 (See Division 2, Subdivision I, 1910.134) for more details and consider consulting an industrial hygienist to help develop a program or review an existing one.



When it comes to PPE, do not forget other important factors such as proper selection, inspection, and training.

Qualified and competent persons

Requirements for qualified and competent persons are in several Oregon OSHA rules such as **fall protection**, **scaffolding**, **steel erection**, **rigging**, **excavation**, **asbestos**, and **lead**. The general definitions for “qualified” and “competent person” are in Division 3, Subdivision C, 1926.32:

- 1926.32(m) “Qualified” means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project.
- 1926.32(f) “Competent person” means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Division 3, Subdivision R (**Steel erection**) also adds the following: “In Oregon, a competent person is considered to be someone with equivalent skills as a qualified person in identifying existing and potential hazards in the workplace, while also being authorized by the employer or employer’s representative to take immediate corrective action to control or eliminate hazards.”



Excavations and rigging



Scaffolding



Asbestos

A competent person must be able to recognize hazards and have the authority to correct them.



Confined spaces

Rigging

Requirements for rigging equipment for material handling are in Division 3, Subdivision H, 1926.251, and include the following:

- Rigging equipment for material handling must be inspected before use on each shift and whenever necessary during its use to ensure that it is safe.
- Defective rigging equipment must be removed from service.
- Rigging equipment must not be loaded in excess of its recommended safe working load (See Division 3, Subdivision H Tables H-1 through H-20).
- Rigging equipment, when not in use, must be removed from the immediate work area so as not to present a hazard to employees.
- Custom-designed grabs, hooks, clamps, or other lifting accessories, for units such as modular panels, prefabricated structures, and similar materials, must be marked to indicate the safe working loads and must be proof-tested before use to 125 percent of their rated load. Included are alloy steel chain, wire rope, metal mesh, natural or synthetic fiber rope (conventional three strand construction), and synthetic web (nylon, polyester, and polypropylene).
- Each day before being used, slings and all fastenings and attachments must be inspected for damage or defects by a competent person designated by the employer (additional inspections must be performed when conditions warrant).





Scaffolding

Oregon OSHA's scaffolding requirements are covered in Division 3, Subdivision L, [Scaffolding](#).

Key sections include:

- Scope, application and definitions, 1926.450
- General requirements, 1926.451
- Additional requirements applicable to specific types of scaffolds, 1926.452
- Aerial lifts, 1926.453
- Training requirements, 1926.454

Oregon OSHA's scaffold standard includes provisions for both supported and suspended scaffolding, in addition to general requirements for capacity and platform construction, safe access, fall protection, falling object protection, safe use, and training. The standard also contains additional requirements for specific types of scaffolds.



Manually propelled elevating aerial platforms – Division 3, Subdivision L, 437-003-0071

When employees use manually propelled elevating aerial platforms as covered by ANSI/SIA A92.3-1990, the manufacturer's operating manual must be with the equipment. You must follow all operating and maintenance instructions and recommendations of the manufacturer.

Boom supported elevating work platforms – Division 3, Subdivision L, 437-003-0073

When employees use boom-supported elevating work platforms as covered by ANSI/SIA A92.5-1992, the manufacturer's operating manual must be with the equipment. Follow all operating and maintenance instructions and recommendations of the manufacturer.

Employees must use personal fall protection that complies with Division 3, Subdivision M, when working in these devices.

Scissor lifts – Division 3, Subdivision L, 437-003-0074

When employees use self-propelled elevating aerial platforms (scissor lifts) as covered by ANSI/SIA A92.6-1990, the manufacturer's operating manual must be with the equipment. Follow all operating and maintenance instructions and recommendations of the manufacturer.

Program directive A-242, Fall protection: aerial lifts used in construction

This Oregon OSHA program directive clarifies the requirement for fall protection when employees are using aerial lifts in construction.

Trenching and excavations

Oregon OSHA's requirements for excavation work are included in Division 3, Subdivision P, **Excavations**. Key sections include:

- Scope, application, and definitions, 1926.650
- Specific excavation requirements, 1926.651
- Underground installations, 437-003-0096
- Requirements for protective systems, 1926.652

Requirements covered in 1926.651 include:

- Surface encumbrances, 1926.651(a)
- Underground installations, 1926.651(b)
- Access and egress, 1926.651(c)
- Exposure to vehicular traffic, 1926.651(d)
- Exposure to falling loads, 1926.651(e)
- Warning system for mobile equipment, 1926.651(f)
- Hazardous atmospheres, 1926.651(g)
- Water accumulation, 1926.651(h)
- Stability of adjacent structures, 1926.651(i)
- Loose rock and soil, 1926.651(j)
- Daily inspections, 1926.651(k)
- Fall protection, 1926.651(l)



Excavation work can be incredibly hazardous. These workers face imminent danger. (OSHA)

Requirements covered in 1926.652 include:

- Protection of employees in excavations, 1926.652(a)
- Design of sloping and benching systems, 1926.652(b)
- Design of support systems, shield systems, and other protective systems, 1926.652(c)
- Materials and equipment, 1926.652(d)
- Installation and removal of support, 1926.652(e)
- Sloping and benching systems, 1926.652(f)
- Shield systems, 1926.652(g)

Each employee in an excavation must be protected from cave-ins by an adequate protective system except when excavations are made entirely in stable rock, or excavations are less than five feet deep and examination of the ground by a competent person provides no indication of a potential cave-in.



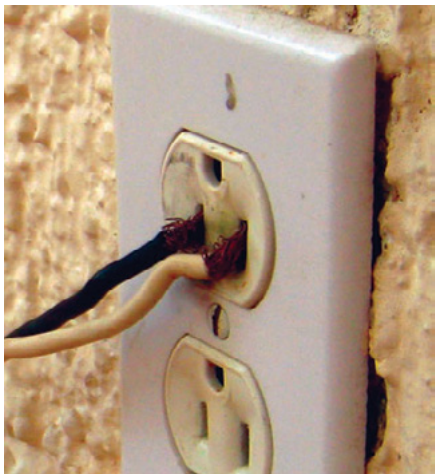
OSI Laborers' Skills Demonstration (October 2008)

Unsafe conditions and unsafe practices

Think of unsafe conditions and unsafe practices as hazards, because if they are not controlled they are likely to cause an injury or illness. Safety hazards cause injuries and health hazards cause illnesses.

Watch for unsafe conditions and unsafe practices; it is something that everyone can do on the job. Missing equipment guards, poorly maintained or defective equipment, and not following written safety procedures are examples. Require employees to report hazards immediately to someone who has authority to act on the report. Employees who report hazards need to be kept informed when and how the hazards will be controlled.

Also, look for new hazards whenever you change equipment, materials, or work processes, and determine how to control them.



Clockwise from top left:
exposed conductors; no fall
protection; no lower blade
guard; and no fall protection,
unstable, no safe access, etc.



Vehicles and mobile equipment

Oregon OSHA's requirements for vehicles and mobile equipment are in Division 3, Subdivision O, **Motor Vehicles, Mechanized Equipment, and Marine Operations**. Key parts of Subdivision O include:

- Equipment, 1926.600
- General requirements, 437-003-0085
- Pinch points, 437-003-0090
- Vehicle drivers and riders, 437-003-3224
- Vehicles for highway and road operation characteristics and maintenance, 437-003-3225
- Vehicles for use on property other than public roads and highways operation, characteristics and maintenance, 437-003-3226
- Material handling equipment (including earthmoving, excavating, and forklifts), 1926.602
- Personnel platforms on forklifts, 437-003-0094
- Pile driving equipment, 1926.603
- Site clearing, 1926.604
- Marine operations and equipment, 1926.605

Safe practices for operating vehicles:

- Do not allow employees to drive or ride in unsafe vehicles.
- Require employees to report any vehicle-related safety problems.
- Secure equipment and tools to prevent them from moving in a vehicle or make sure a barrier is in place to protect the passengers.
- Ensure that vehicles have working horns that can be heard above any surrounding noise.
- Any vehicle that has an obstructed view to the rear must have a backup alarm that can be heard above surrounding noise unless there is a spotter or it is certain that no one can enter the danger area.



Safe practices must be established and enforced when working around mobile equipment and vehicles.

Welding and cutting

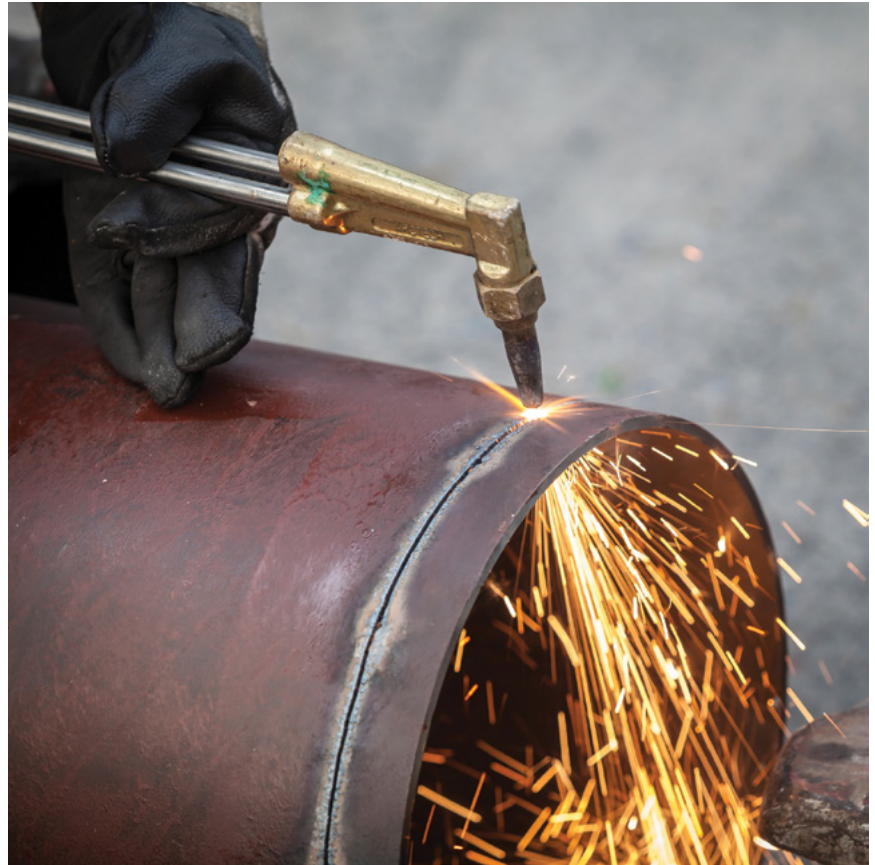
Oregon OSHA's welding requirements are in Division 3, **Subdivision J**, and include the following sections:

- Oxygen-fuel gas welding and cutting, 437-002-2253
- Arc welding and cutting, 1926.351
- Fire prevention, 1926.352
- Ventilation and protection in welding, cutting, and heating (includes confined spaces), 1926.353
- Welding, cutting, and heating in way of preservative coatings, 1926.354

Welding and cutting hazards include:

- Fire and explosion
- Chemical exposure, smoke, fumes, gas
- Burns (eye and skin)
- Noise
- Radiation
- Electric shock

Safe welding and cutting practices include ventilation, guards (screens and covers), and personal protective equipment (gloves, hood/helmet, eye and face protection, and respirators).



X-rays and other radiation

Oregon OSHA's radiation rules, in Division 3, **Subdivision D**, cover **ionizing radiation** and **non-ionizing radiation**.

Electromagnetic (EM) radiation

The most familiar form of electromagnetic (EM) radiation is sunshine, which provides light and heat. Sunshine consists primarily of radiation in infrared (IR), visible, and ultraviolet (UV) frequencies. Lasers also emit EM radiation in these "optical frequencies."

Ionizing radiation and non-ionizing radiation

The higher frequencies of EM radiation, consisting of X-rays and gamma rays, are types of ionizing radiation. Lower frequency radiation, consisting of ultraviolet (UV), infrared (IR), microwave (MW), radio frequency (RF), and extremely low frequency (ELF) are types of non-ionizing radiation. If not properly controlled, non-ionizing radiation, which is found in a wide range of occupational tasks including use of lasers and electric welding, can pose a health risk to potentially exposed employees.



Lasers

Laser stands for “Light Amplification by Stimulated Emission of Radiation.” The laser produces an intense, directional beam of light. The most common cause of laser-induced tissue damage is thermal in nature, where the tissue proteins are denatured due to the temperature rise following absorption of laser energy.

Because some lasers can damage eyes and skin:

- Only qualified, trained employees can install, adjust, and operate laser equipment.
- Laser equipment operators must be able to show proof that they are qualified when they are operating laser equipment.
- Employees who work in areas where potential exposure to laser light greater than five milliwatts exists, must be provided with anti-laser eye protection.
- Areas in which lasers are used must have laser warning signs.
- The laser beam must not be directed at employees.
- Laser equipment must have a label that indicates maximum output.



Y our attitude

- Do you think accidents only happen to other people?
- Do you ignore unsafe situations because it is “not your job”?
- Do you think that an accident will not happen because it has never happened before?
- What if someone close to you was seriously injured in a workplace accident? Would this change your attitude towards safety?

Be aware of your attitude and how it affects others on the job. Do not wait for an accident to happen before you change your attitude towards safety.



Working within a culture that supports a positive attitude toward safety can do wonders to ensure safe construction sites. *OSI Laborer's Skills Demonstration (October 2008)*



Hoffman Construction Company

Over a third of all accepted disabling claims reported to the Oregon Workers' Compensation Division are sprains/strains and other musculoskeletal disorders. Although construction work will always include lifting, carrying, and pulling (among others), many contractors have made great strides in preventing these types of injuries through pre-task planning, employee involvement, medical management, and training their crews to recognize risk factors and best practices.

Zero energy state (lockout/tagout)

Lockout and tagging of electrical circuits – Division 3, Subdivision K, 1926.417

- Controls that are deactivated during work on equipment or circuits must be tagged
- Equipment or circuits that are de-energized must be inoperative and must have tags attached at all points where they can be energized
- Tags must be placed to identify plainly the equipment or circuits being worked on

The control of hazardous energy (lockout/tagout) – Division 2, Subdivision J, 1910.147(c)

Energy control program. The employer must establish a program consisting of energy control procedures, employee training, and periodic inspections. The purpose is to ensure that equipment is isolated from the energy source and made inoperative before any employee performs any service or maintenance where the unexpected energizing, start up, or release of stored energy could occur.

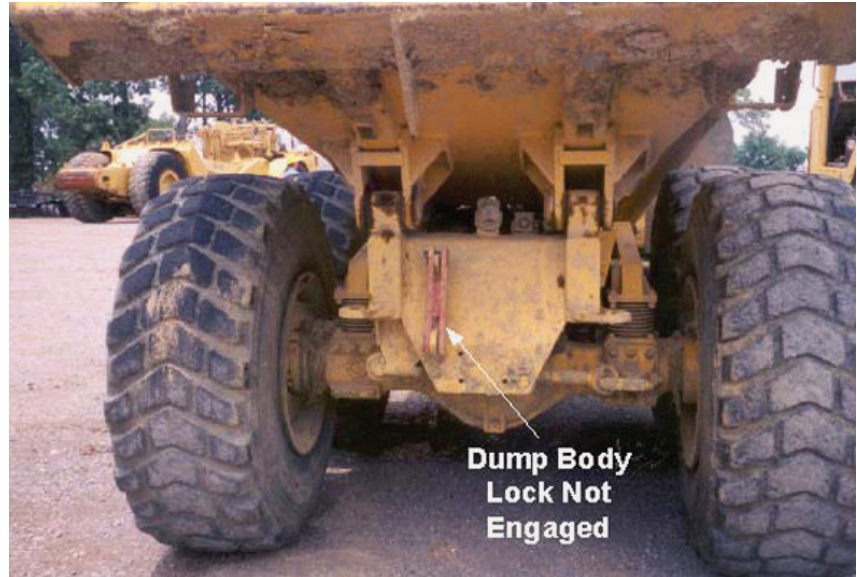
Energy control procedures must clearly outline the following steps for:

- Shutting down the equipment
- Isolating, blocking, and securing the equipment to control hazardous energy
- The placement, removal, and transfer of lockout/tagout devices and who is responsible for them
- The requirements for testing equipment to verify the effectiveness of lockout and tagout devices



Vehicles for highway and road operation characteristics and maintenance – Division 3, Subdivision O, 437-003-3225(8)

- Block or crib heavy equipment supported by slings, hoists, jacks; prevent the equipment from falling when employees work underneath it.
- During equipment repair or maintenance tasks set all controls to “neutral,” stop the motor, and set the brakes.
- During maintenance or inspection on vehicles with dump bins, use an attached, lockable support that prevents unintentional lowering of the bin.
- Disconnect the vehicle battery if the energized system could cause injury.



Dump-truck driver dies after being caught between frame and dump body of off-road truck while performing routine lubrication – Tennessee. *NIOSH In-house FACE Report 2002-08.*

*Oregon*OSHA **Services**

Oregon OSHA offers a wide variety of safety and health services to employers and employees:

Appeals

503-947-7426; 800-922-2689; admin.web@oregon.gov

- Provides the opportunity for employers to hold informal meetings with Oregon OSHA on concerns about workplace safety and health.
- Discusses Oregon OSHA's requirements and clarifies workplace safety or health violations.
- Discusses abatement dates and negotiates settlement agreements to resolve disputed citations.

Conferences

503-378-3272; 888-292-5247, Option 1; oregon.conferences@oregon.gov

- Co-hosts conferences throughout Oregon that enable employees and employers to learn and share ideas with local and nationally recognized safety and health professionals.

Consultative Services

503-378-3272; 800-922-2689; consult.web@oregon.gov

- Offers no-cost, on-site safety and health assistance to help Oregon employers recognize and correct workplace safety and health problems.
- Provides consultations in the areas of safety, industrial hygiene, ergonomics, occupational safety and health programs, assistance to new businesses, the Safety and Health Achievement Recognition Program (SHARP), and the Voluntary Protection Program (VPP).

Enforcement

503-378-3272; 800-922-2689; enforce.web@oregon.gov

- Offers pre-job conferences for mobile employers in industries such as logging and construction.
- Inspects places of employment for occupational safety and health hazards and investigates workplace complaints and accidents.
- Provides abatement assistance to employers who have received citations and provides compliance and technical assistance by phone.

Public Education

503-947-7443; 888-292-5247, Option 2; ed.web@oregon.gov

- Provides workshops and materials covering management of basic safety and health programs, safety committees, accident investigation, technical topics, and job safety analysis.

Standards and Technical Resources

503-378-3272; 800-922-2689; tech.web@oregon.gov

- Develops, interprets, and gives technical advice on Oregon OSHA's safety and health rules.
- Publishes safe-practices guides, pamphlets, and other materials for employers and employees
- Manages the Oregon OSHA Resource Center, which offers safety videos, books, periodicals, and research assistance for employers and employees.

Need more information?

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