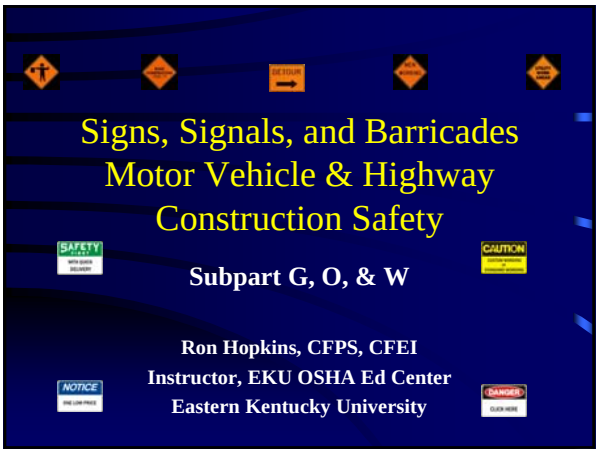


Signs, Signals, and Barricades,
Subparts G, W, and O

Upon successful completion of this module, each participant will be able to:

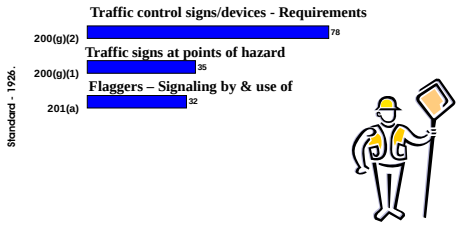
- Discuss common hazards related to motor vehicles, mechanized equipment, marine operations, and powered industrial trucks in construction.
- Discuss requirements in 29 CFR 1926 Subpart O and Subpart W.
- Discuss requirements for industrial trucks in construction.

Contents

Subpart G: Signs, Signals, and Barricades

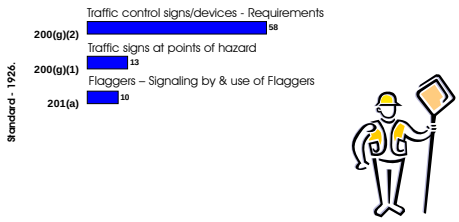
- 1926.200 Accident Prevention Signs and Tags
- 1926.201 Signaling
- 1926.202 Barricades
- 1926.203 Definitions Applicable to this subpart

Subpart G - Signs, Signals & Barricades
(1926.200 - 203)



Number of Serious Violations - FY 2010 5

Subpart G - Signs, Signals & Barricades
(1926.200 - 203)



Number of Serious Violations - FY 2011 6

Subpart G
Signs, Signals & Barricades
(1926.200 - 203)

Subpart & Standard 1926.

1926.200 Accident Prevention Signs

- Signs and symbols must be visible at all times while work is being performed.
- Promptly removed or covered when hazard no longer exists.

Accident Prevention Signs

Numerous signs on the market such as the following:

- Danger
- Caution
- Safety First
- Notice

Accident Prevention Tags

- Temporary means to warn employees of an existing hazard(defective tools, equipment)
- Not a substitute for signs
- ANSI Z35.1-1968 and Z35.2-1968* (Specifications for Accidents Prevention Tags) contain rules that must be complied with by employer

*Z35.1and .2.1968 has been withdrawn and replaced with ANSI Z535.2

Accident Prevention Tags

Background	Safety Colors	Copy Specifications
White	Red	Do Not Operate
White	Black and Red	Danger
Yellow	Black	Caution
White	Black	Out of Order

Danger Signs 1926.200(b)

- (b)(1) Used only where immediate danger is present that could result in death or serious injury.
- Removed or covered when hazard no longer exist.

Danger Signs

- Danger signs shall have red as the predominating color for the upper panel with; black outline on the border; and white lower panel for additional wording.

Caution Signs

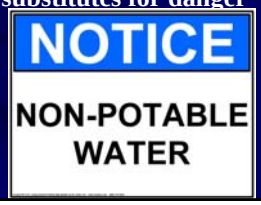
- Caution Signs shall be used to caution against unsafe practices.
- Shall have yellow as the predominate color; black upper panel/border; and yellow lower panel.

Safety Instruction Sign

- Safety instruction signs, when used, shall be white with green upper panel with white letters to convey principal message all other letters in black.

General Information (Other Types of Signs)

- General information signs are white background and blue upper.
- Used to indicate general safety rules
- Not to be used as substitutes for danger or caution signs.



Warning Tags and Signs

Exit Signs

- Must have legible red letters (six inches high)
- White field
- Strokes of letters must be .75 inch wide

EXIT

Traffic Signs

- Construction areas shall be posted with legible traffic signs at points of hazard.
- OSHA currently issued a final notice that all signals, signs, and barricades used to protect highway workers are to comply with:
  - Part VI of the 1988 MUTCD with 1993 revisions or the Millennium Edition of MUTCD (instead of the current ANSI D6.1-1971 standard/1971 MUTCD.

What is the MUTCD?

- Defines the standards used by road managers nationwide to install and maintain traffic control devices on all streets and highways.
- Set forth by Federal Highway Administration

MUTCD

Manual of Uniform Traffic Control Devices

- Sign dimension
- Barricade specs.
- Locating & Spacing

Elements of Work Zone Safety

The main provisions that need to be addressed in work zone safety include:

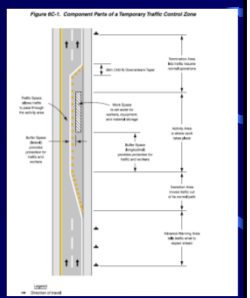
- High-visibility Clothing
- Traffic Control Devices
- Work-zone Protection Plans
- Law-Enforcement and Public Awareness
- Worker Training

Training of Workers

- All workers should be trained in how to reduce vulnerability when working near traffic.
- Workers having specific traffic control responsibility should be trained in temporary traffic control techniques, devices, and placement.

Types of Traffic Control Devices

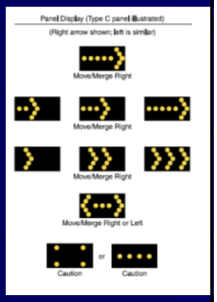
- Signage
- Variable Message Signs (VMS)
- Arrow Boards
- Channeling Devices



Traffic Control Devices

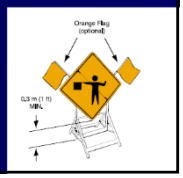
Traffic control devices should be placed in the area based on:

- Duration and type of operation
- Lateral clearance
- Time, volume, and speed of traffic



Traffic Control Devices-Signs

- To warn, direct traffic
- Size and color dictated by DOT
- Mounted on “trees”, post, trucks, barricades

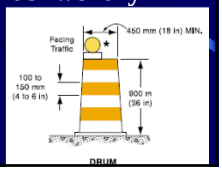


Traffic Control Devices-VMS

- Up to the minute messages for motorist
- Decrease driver aggravation
- Often register better than printed signs

Traffic Control Devices-Channel Devices

- Barrels, cones, tubes, panels, barricades
- Highly Visible
- Lightweight, ballasted, crashworthy

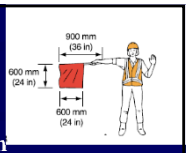


Signaling/Flagmen

- When operations are such the signs, signals, or barricades do not provide necessary protection, Flagmen or other appropriate traffic control devices shall be provided

Flagmen

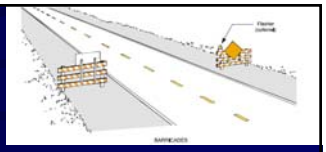
- Hand signaling shall be by the use of squares flags or sign paddles with 6 inch letters, and in periods of darkness red lights.
- Uniform Manuel on Traffic Control Devices: Signals- paddles, flags for emergencies.
- Flagmen must wear orange or red garments (yellow or yellow-green vest are acceptable) (retro reflective at night)



Flagger Safety

- Flaggers must be trained before assigned to work
- Duties include always face traffic, and remain alert at all times.
- Flaggers working in tandem must stay in constant visual or radio communications

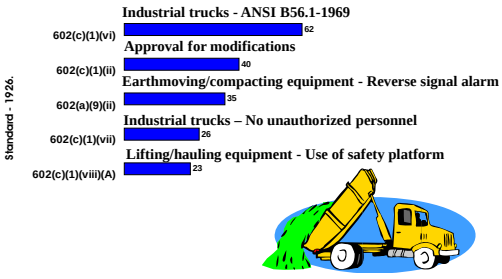
Barricades



- Barricades for the protection of employees must comply with the Manuel on uniform Traffic Control Devices for Street and Highways
- Barricades are needed to protect workers from traffic hazards.
- Off Road considerations.

Subpart O: Motor Vehicles and Mechanized Equipment

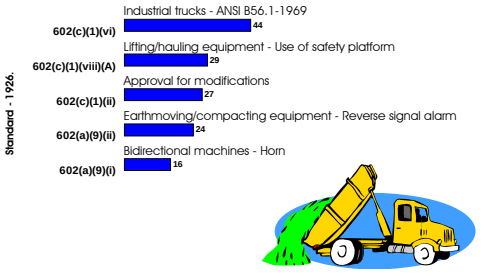
Subpart O - Motor Vehicles, Mechanized Equipment, & Marine Operations (1926.600 - 606)



Number of Serious Violations - FY 2010

34

Subpart O - Motor Vehicles, Mechanized Equipment, & Marine Operations (1926.600 - 606)



Number of Serious Violations - FY 2011

35

Subpart O
Motor Vehicles, Mechanized Equipment, & Marine Operations (1926.600 - 606)

Motor Vehicles and Mechanized Equipment - General Requirements

- Bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment, shall be either fully lowered or blocked when being repaired or when not in use.
- All controls shall be in a neutral position, with the motors stopped and brakes set, unless work being performed requires otherwise.

Motor Vehicles and Mechanized Equipment - General Requirements

Be cautious of:

- Wheel chocks not wide or tall enough
- Loose Soil

Motor Vehicles and Mechanized Equipment - General Requirements

The use and care of batteries shall conform with subpart K which requires:

- Unsealed batteries in well vented room
- Floors acid resistant construction
- Use of appropriate PPE
- Safety shower/eyewash and spill kit

Motor Vehicles and Mechanized Equipment - General Requirements, 1926.600 (a)

- All cab glass shall be safety glass or equivalent and no visible distortions
- All equipment in the vicinity of overhead power lines must comply with Refer to 1926.600(6)(i)

Motor Vehicles and Mechanized Equipment - General Requirements

- All motor vehicles left unattended at night must have lights or reflectors and barricades with lights to identify location.
- A safety tire rack, or cage shall be provided when mounting, inflating, or demounting tires on split rims or locking rings.

Motor Vehicles, 1926.601

- Applies to off road jobsites vehicles
- Braking systems (service, emergency, and parking) must be operable
- Lights dependent upon visibility as needed (minimum: head/tail lights)
- Operable brake lights
- Audible warning device (may include back up alarm or spotter)

Motor Vehicles, 1926.601

- Cabs must have windshield/wipers
- Tools and equipment secured
- Employee transportation: seat/belts
- Belts must meet DOT requirements for seat belts and anchorage
- Dump bodies must have support and able to lock to prevent accidental tripping

Motor Vehicles, 1926.601

- Cab shield or canopy (if loaded with power equipment)
- Operating levers to dump/hoist equipped with latch
- Trip handles arrange to maintain clearance of operators
- Fenders for rubber tire equipment (in some cases mud flaps accepted)

Vehicle Inspections

- Inspections are required at each shift.
- Inspect brake, tires, horn, steering, seating, operating and safety devices.
- Additional items:
  - Lights
  - Reflectors
  - Wipers
  - Fire Extinguishers

Earthmoving Equipment, 1926.602 (a)

- Equipment includes: scrapers, loaders, tractors, bulldozers, graders and similar.
- Seatbelts (Society of Auto Engineers)
- Access and grade must be safe
- Brakes must hold the full load
- Fenders to prevent hazard from materials
- ROPS
- Audible alarm and reverse alarm

Earthmoving Equipment, 1926.602 (a)

Caution must be used when operating this equipment

- Lifting
- Not road Worthy

Safe Work Practices

- Do not place equipment too close to the excavation.
- Do not allow workers to be near the bucket during operation.
- Do not straddle a trench with equipment.

Fork Lift Training Requirements
1910.178(I)

- Employer shall ensure that each operator is competent as demonstrated as through training and evaluation.
- Training is required initially and refresher training every three years.
- Training must be certified in writing.

Fork Lift Training Requirements
1910.178(I)

- Training must be combination of formal instruction, practical training (demonstrations), and evaluations.
- Training must include: truck related topics: (instructions, differences, controls, engine operation, steering, visibility, capacity, stability, inspection, refueling, and limitations.

Fork Lift Training Requirements
1910.178(I)

Workplace related topics must include:

- Surface conditions
- Composition of loads
- Manipulation
- Pedestrian traffic
- Narrow aisles
- Hazardous locations
- Ramps
- Closed environments and unique conditions.

Pile Driving Equipment

- Keep clear during hoist and blowout
- Access pits need to have ladders and curbs
- Stop blocks must be provided to prevent contact with head block

Pile Driving Equipment

- Guards to prevent cables from jumping out of sheaves
- Overhead protection must not interfere with vision and be 2 inch planking or equivalent
- Engineers and winch men shall accept signals only from designated signalmen

Subpart W: Rollover Protective Structures (ROPS) for Material Handling Equipment

1926.1000 – 1926.1003

Rollover Protective Structures (ROPS) for Material Handling Equipment

This section applies to the following types of material handling equipment:

- All rubber-tired, self-propelled scrapers,
- Rubber-tired front-end loaders,
- Rubber-tired dozers,
- Wheel-typed agricultural/industrial tractors,
- Crawler tractors,
- Crawler-type loaders and motor graders

Rollover Protective Structures (ROPS) Requirements

Manufactured on or after September 1, 1972 shall be equipped with rollover protective structures which meets requirements in 1926.1001/1002 as applicable.

Rollover Protective Structures (ROPS) Requirements

- Design objective shall be to minimize likelihood of overturn and injury of operator.
- Vertical clearance of at least 52 inches from work deck to the ROPS at the point of ingress and egress.

Rollover Protective Structures (ROPS) Labeling

Each ROPS shall have the following information permanently affixed to the structure:

- Manufacturers or fabricator's name and address,
- ROPS model number,
- Machine make, model, or series number that the structure is designed to fit.

Operator Training!

If time permits

Signs, Signals, and Barricades Motor Vehicle & Highway Construction Safety

Questions?

Ron Hopkins, CFPS, CFEI
Instructor, EKU OSHA Ed Center
Eastern Kentucky University