Part 13 Mobile Equipment and Work Zone Safety

Student Materials

MTI Level Two Compliance Course
Consultation Education and Training Division
Michigan Occupational Safety and Health Administration
Michigan Department of Labor and Economic Opportunity
www.michigan.gov/miosha
517-284-7720

(Revised 3/24)

Construction Part 13, Mobile Equipment and Work Zone Safety

MIOSHA Training Institute (MTI) Construction Compliance Course

Presented By:
Consultation Education and Training (CET) Division
Michigan Occupational Safety and Health Administration
Michigan Department of Labor and Economic Opportunity
www.michigan.gov/miosha
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1

Objectives

Module 1: Mobile Equipment Safety

- MIOSHA Standard – 13
- Training Requirements
- Accident Investigations
- Material Review

2

2

Objectives

Module 2: Work Zone Safety

- MIOSHA Standard – 22
- MMUTCD
- Training Requirements
- Accident Investigations
- Material Review

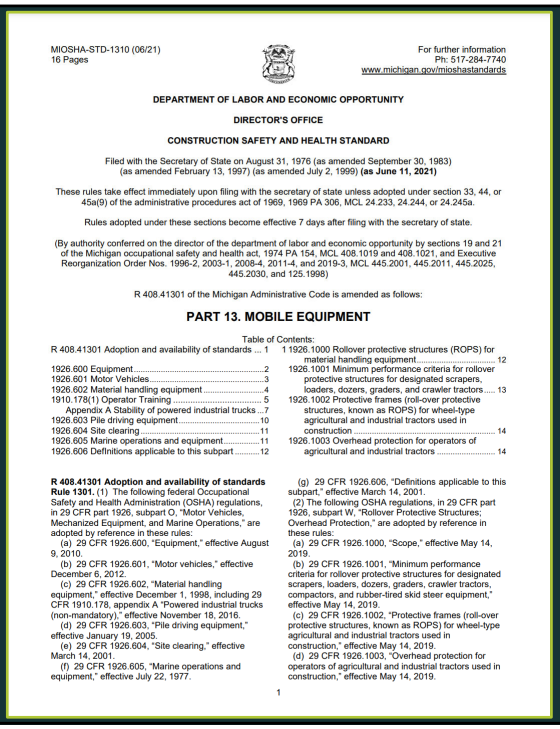
3

3

Module 1: Mobile Equipment Safety

4

4



MIOSHA-STD-1310 (06/21)
16 Pages

For further information
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DEPARTMENT OF LABOR AND ECONOMIC OPPORTUNITY

DIRECTOR'S OFFICE

CONSTRUCTION SAFETY AND HEALTH STANDARD

Filed with the Secretary of State on August 31, 1976 (as amended September 30, 1983) (as amended February 13, 1997) (as amended July 2, 1999) **(as June 11, 2021)**

These rules take effect immediately upon filing with the secretary of state unless adopted under section 33, 44, or 45a(9) of the administrative procedures act of 1969, 1969 PA 306, MCL 24.233, 24.244, or 24.245a.

Rules adopted under these sections become effective 7 days after filing with the secretary of state.

(By authority conferred on the director of the department of labor and economic opportunity by sections 19 and 21 of the Michigan occupational safety and health act, 1974 PA 154, MCL 408.1019 and 408.1021, and Executive Reorganization Order Nos. 1996-2, 2003-1, 2008-4, 2011-4, and 2019-3, MCL 445.2001, 445.2011, 445.2025, 445.2030, and 125.1998)

R 408.41301 of the Michigan Administrative Code is amended as follows:

PART 13. MOBILE EQUIPMENT

Table of Contents:

R 408.41301 Adoption and availability of standards Rule 1301. (1) The following federal Occupational Safety and Health Administration (OSHA) regulations, in 29 CFR part 1926, subpart O, "Motor Vehicles, Mechanized Equipment, and Marine Operations," are adopted by reference in these rules:

(a) 29 CFR 1926.600, "Equipment," effective August 9, 2010.

(b) 29 CFR 1926.601, "Motor vehicles," effective December 6, 2012.

(c) 29 CFR 1926.602, "Material handling equipment," effective December 1, 1998, including 29 CFR 1910.178, appendix A "Powered industrial trucks (non-mandatory)," effective November 18, 2016.

(d) 29 CFR 1926.603, "Pile driving equipment," effective January 19, 2005.

(e) 29 CFR 1926.604, "Site clearing," effective March 14, 2001.

(f) 29 CFR 1926.605, "Marine operations and equipment," effective July 22, 1977.

(g) 29 CFR 1926.606, "Definitions applicable to this subpart," effective March 14, 2001.

(2) The following OSHA regulations, in 29 CFR part 1926, subpart W, "Rollover Protective Structures; Overhead Protection," are adopted by reference in these rules:

(a) 29 CFR 1926.1000, "Scope," effective May 14, 2019.

(b) 29 CFR 1926.1001, "Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, crawler tractors, compactors, and rubber-tired skid steer equipment," effective May 14, 2019.

(c) 29 CFR 1926.1002, "Protective frames (roll-over protective structures, known as ROPS) for wheel-type agricultural and industrial tractors used in construction," effective May 14, 2019.

(d) 29 CFR 1926.1003, "Overhead protection for operators of agricultural and industrial tractors used in construction," effective May 14, 2019.

1

The Standard:

Part 13, Mobile Equipment

as amended June 11, 2021

26–pages

5

5

Table of Contents

PART 13, MOBILE EQUIPMENT

Table of Contents:

6

6

1926.600 Equipment

7

7

1926.600 Equipment

(a) General requirements

1926.600(a)(1) All equipment left unattended at night, adjacent to a highway in normal use, or adjacent to construction areas where work is in progress, shall have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, to identify the location of the equipment.

8

8

1926.600 Equipment

(a) General requirements

1926.600(a)(3)(i) Heavy machinery, equipment, or parts thereof, which are suspended or held aloft by use of slings, hoists, or jacks shall be substantially blocked or cribbed to prevent falling or shifting before employees are permitted to work under or between them. 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.

9

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1926.600 Equipment

(a) General requirements

1926.600(a)(3)(ii) Whenever the equipment is parked, the parking brake shall be set. Equipment parked on inclines shall have the wheels chocked and the parking brake set.

10

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1926.600 Equipment

(a) General requirements

1926.600(a)(5) All cab glass shall be safety glass, or equivalent, that introduces no visible distortion affecting the safe operation of any machine covered by this subpart.

11

11

1926.600 Equipment

(a) General requirements

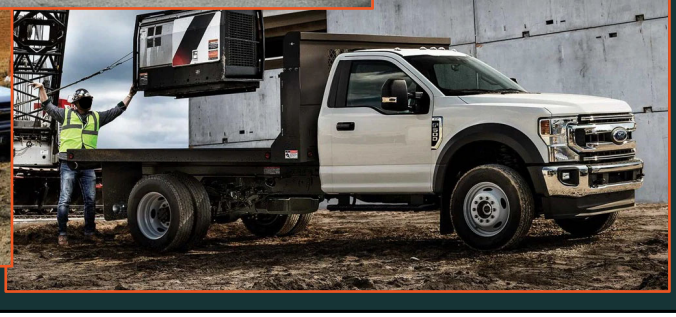
1926.600(a)(6) All equipment covered by this subpart shall comply with the requirements of 1926.550(a)(15) when working or being moved in the vicinity of power lines or energized transmitters.

29 CFR 1926.550(a)(15)(i) as applicable is enforced as written: For lines rated 50 KV or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet.

12

12

1926.601 Motor Vehicles



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13

1926.601 Motor Vehicles

(a) Coverage

1926.601(a) Motor vehicles as covered by this part are those vehicles that operate within an off-highway jobsite, not open to public traffic. The requirements of this section do not apply to equipment for which rules are prescribed in 1926.602.

14

14

1926.601 Motor Vehicles

(b) General requirements

1926.601(b)(1) All vehicles shall have a service brake system, an emergency brake system, and a parking brake system. These systems may use common components and shall be maintained in operable condition.

15

15

1926.601 Motor Vehicles

(b) General requirements

1926.601(b)(2)(i) Whenever visibility conditions warrant additional light, all vehicles, or combinations of vehicles, in use shall be equipped with at least two headlights and two taillights in operable condition.

(ii) All vehicles, or combination of vehicles, shall have brake lights in operable condition regardless of light conditions.

16

16

1926.601 Motor Vehicles

(b) General requirements

1926.601(b)(3) All vehicles shall be equipped with an adequate audible warning device at the operator's station and in an operable condition.

17

17

1926.601 Motor Vehicles

(b) General requirements

1926.601(b)(4) No employer shall use any motor vehicle equipment having an obstructed view to the rear unless:

(i) The vehicle has a reverse signal alarm audible above the surrounding noise level or:

(ii) The vehicle is backed up only when an observer signals that it is safe to do so.

18

18

1926.601 Motor Vehicles

(b) General requirements

1926.601(b)(5) All vehicles with cabs shall be equipped with windshields and powered wipers. Cracked and broken glass shall be replaced. Vehicles operating in areas or under conditions that cause fogging or frosting of the windshields shall be equipped with operable defogging or defrosting devices.

19

19

1926.601 Motor Vehicles

(b) General requirements

1926.601(b)(6) All haulage vehicles, whose pay load is loaded by means of cranes, power shovels, loaders, or similar equipment, shall have a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.

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1926.601 Motor Vehicles

(b) General requirements

1926.601(b)(7) Tools and material shall be secured to prevent movement when transported in the same compartment with employees.

21

21

1926.601 Motor Vehicles

(b) General requirements

1926.601(b)(8) Vehicles used to transport employees shall have seats firmly secured and adequate for the number of employees to be carried.

1926.601(b)(9) Seat belts and anchorages meeting the requirements of 49 CFR Part 571 (Department of Transportation, Federal Motor Vehicle Safety Standards) shall be installed in all motor vehicles.

22

22

1926.601 Motor Vehicles

(b) General requirements

1926.601(10) Trucks with dump bodies shall be equipped with positive means of support, permanently attached, and capable of being locked in position to prevent accidental lowering of the body while maintenance or inspection work is being done.

23

23

1926.601 Motor Vehicles

(b) General requirements

1926.601(b)(11) Operating levers controlling hoisting or dumping devices on haulage bodies shall be equipped with a latch or other device which will prevent accidental starting or tripping of the mechanism.

1926.601(b)(12) Trip handles for tailgates of dump trucks shall be so arranged that, in dumping, the operator will be in the clear.

24

24

1926.601 Motor Vehicles

(b) General requirements

1926.601(b)(13)
(i) All rubber-tired motor vehicle equipment manufactured on or after May 1, 1972, shall be equipped with fenders. All rubber-tired motor vehicle equipment manufactured before May 1, 1972, shall be equipped with fenders not later than May 1, 1973.

(ii) Mud flaps may be used in lieu of fenders whenever motor vehicle equipment is not designed for fenders.

25

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1926.601 Motor Vehicles

(b) General requirements

1926.601(b)(14) All vehicles in use shall be checked at the beginning of each shift to assure that the following parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use: service brakes, including trailer brake connections; parking system (hand brake); emergency stopping system (brakes); tires; horn; steering mechanism; coupling devices; seat belts; operating controls; and safety devices. All defects shall be corrected before the vehicle is placed in service. These requirements also apply to equipment such as lights, reflectors, windshield wipers, defrosters, fire extinguishers, etc., where such equipment is necessary.

26

26

1926.602 Material Handling Equipment

27

27

1926.602 Material Handling Equipment

(a) Earthmoving equipment; general

1926.602(a)(1) These rules apply to the following types of earthmoving equipment: scrapers, loaders, crawler or wheel tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors, and similar equipment. The promulgation of specific rules for compactors and rubber-tired “skid-steer” equipment is reserved pending consideration of standards currently being developed.

28

28

1926.602 Material Handling Equipment

(a) Earthmoving equipment; general

1926.602(a)(2)(i) Seat belts shall be provided on all equipment covered by this section and shall meet the requirements of the Society of Automotive Engineers, J386-1969, Seat Belts for Construction Equipment. Seat belts for agricultural and light industrial tractors shall meet the seat belt requirements of Society of Automotive Engineers J333a-1970, Operator Protection for Agricultural and Light Industrial Tractors.

29

29

1926.602 Material Handling Equipment

(a) Earthmoving equipment; general

1926.602(a)(2)

(ii) Seat belts need not be provided for equipment which is designed only for stand-up operation.

(iii) Seat belts need not be provided for equipment which does not have rollover protective structure (ROPS) or adequate canopy protection.

30

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1926.602 Material Handling Equipment

(a) Earthmoving equipment; general

1926.602(a)(3) Access roadways and grades.

(i) No employer shall move or cause to be moved construction equipment or vehicles upon any access roadway or grade unless the access roadway or grade is constructed and maintained to accommodate safely the movement of the equipment and vehicles involved.

31

31

1926.602 Material Handling Equipment

(a) Earthmoving equipment; general

1926.602(a)(4) Brakes.

All earthmoving equipment mentioned in 1926.602(a) shall have a service braking system capable of stopping and holding the equipment fully loaded, as specified in Society of Automotive Engineers SAEJ237, Loader Dozer-1971, J236, Graders-1971, and J319b, Scrapers-1971. Brake systems for self-propelled rubber-tired off-highway equipment manufactured after January 1,1972 shall meet the applicable minimum performance criteria set forth in the following Society of Automotive Engineers Recommended Practices.

32

32

1926.602 Material Handling Equipment

(a) Earthmoving equipment; general

1926.602(a)(5) Fenders. Pneumatic-tired earth-moving haulage equipment (trucks, scrapers, tractors, and trailing units) whose maximum speed exceeds 15 miles per hour, shall be equipped with fenders on all wheels to meet the requirements of Society of Automotive Engineers SAE J321a-1970, Fenders for Pneumatic-Tired Earthmoving Haulage Equipment.

33

33

1926.602 Material Handling Equipment

(a) Earthmoving equipment; general

1926.602(a)(9) Audible alarms.

(i) All bidirectional machines, such as rollers, compacters, front-end loaders, bulldozers, and similar equipment, shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction. The horn shall be maintained in an operative condition.

34

34

1926.602 Material Handling Equipment

(a) Earthmoving equipment; general

1926.602(a)(9) Audible alarms.

(ii) No employer shall permit earthmoving or compacting equipment which has an obstructed view to the rear to be used in reverse gear unless the equipment has in operation a reverse signal alarm distinguishable from the surrounding noise level or an employee signals that it is safe to do so.

35

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1926.602 Material Handling Equipment

(b) Excavating and other equipment

1926.602(b)(1) Tractors covered in paragraph (a) of this section shall have seat belts as required for the operators when seated in the normal seating arrangement for tractor operation, even though back-hoes, breakers, or other similar attachments are used on these machines for excavating or other work.

36

36

1926.602 Material Handling Equipment

(c) Lifting and hauling equipment (other than covered under Subpart N*)

*Rule 1301. (9) A reference to 29 CFR part 1926, subpart N, “Helicopters, Hoists, Elevators, and Conveyors,” means this standard and both of the following:

(a) Construction Standard Part 10, Cranes and Derricks

(b) Construction Standard Part 15, Excavators, Hoists, Elevators, Helicopters, and Conveyors

37

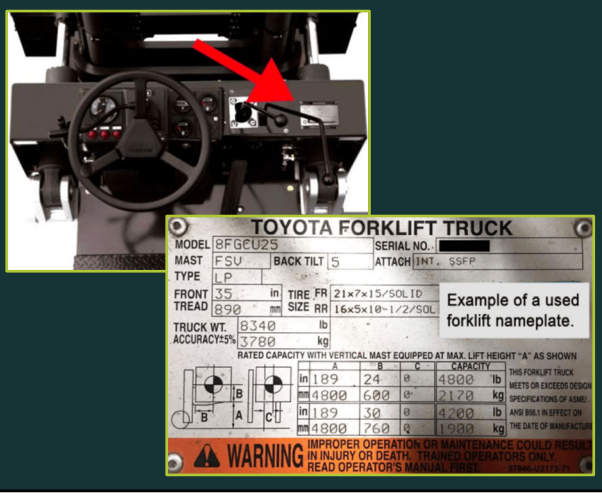
37

1926.602 Material Handling Equipment

(c) Lifting and hauling equipment (other than covered under Subpart N)

1926.602(c)(1) Industrial trucks shall meet the requirements of §§1926.600 and the following:

(i) Lift trucks, stackers, etc., shall have the rated capacity clearly posted on the vehicle so as to be clearly visible to the operator. When auxiliary removable counterweights are provided by the manufacturer, corresponding alternate rated capacities also shall be clearly shown on the vehicle. These ratings shall not be exceeded.



Example of a used forklift nameplate.

38

38

1926.602 Material Handling Equipment

(c) Lifting and hauling equipment (other than covered under Subpart N)

1926.602(c)(1) Industrial trucks shall meet the requirements of §§1926.600 and the following:

(ii) No modifications or additions which affect the capacity or safe operation of the equipment shall be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

39

39

1926.602 Material Handling Equipment

(c) Lifting and hauling equipment (other than covered under Subpart N)

1926.602(c)(1) Industrial trucks shall meet the requirements of §§1926.600 and the following:

(iii) If a load is lifted by two or more trucks working in unison, the proportion of the total load carried by any one truck shall not exceed its capacity.

40

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1926.602 Material Handling Equipment

(c) Lifting and hauling equipment (other than covered under Subpart N)

1926.602(c)(1) Industrial trucks shall meet the requirements of §§1926.600 and the following:

(v) All high lift rider industrial trucks shall be equipped with overhead guards which meet the configuration and structural requirements as defined in paragraph 421 of American National Standards Institute B56.1-1993, Low Lift and High Lift Trucks.

41

41

1926.602 Material Handling Equipment

(c) Lifting and hauling equipment (other than covered under Subpart N)

1926.602(c)(1) Industrial trucks shall meet the requirements of §§1926.600 and the following:

(vi) All industrial trucks in use shall meet the applicable requirements of design, construction, stability, inspection, testing, maintenance, and operation, as defined in American National Standards Institute B56.1-1993, Low Lift and High Lift Trucks.

42

42

1926.602 Material Handling Equipment

(c) Lifting and hauling equipment (other than covered under Subpart N)

1926.602(c)(1) Industrial trucks shall meet the requirements of §§1926.600 and the following:

(vii) Unauthorized personnel shall not be permitted to ride on powered industrial trucks. A safe place to ride shall be provided where riding of trucks is authorized.

43

43

1926.602 Material Handling Equipment

(d) Powered industrial truck operator training

1926.602(d)(1) Safe operation.

(i) The employer shall ensure that each powered industrial truck operator is competent to operate a powered industrial truck safely, as demonstrated by the successful completion of the training and evaluation specified in this paragraph (l).

44

44

1926.602 Material Handling Equipment

(d) Powered industrial truck operator training

1926.602(d)(1) Safe operation.

(ii) Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the employer shall ensure that each operator has successfully completed the training required by this paragraph (l), except as permitted by paragraph (l)(5).

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1926.602 Material Handling Equipment

(d) Powered industrial truck operator training

1926.602(d)(2) Training program implementation.

(i) Trainees may operate a powered industrial truck only:

(A) Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence; and

(B) Where such operation does not endanger the trainee or other employees.

46

46

1926.602 Material Handling Equipment

(d) Powered industrial truck operator training

1926.602(d)(2) Training program implementation.

(ii) Training shall consist of a combination of formal instruction (e.g., lecture, discussion, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and evaluation of the operator's performance in the workplace.

47

47

1926.602 Material Handling Equipment

(d) Powered industrial truck operator training

1926.602(d)(2) Training program implementation.

(iii) All operator training and evaluation shall be conducted by persons who have the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence.

48

48

1926.602 Material Handling Equipment

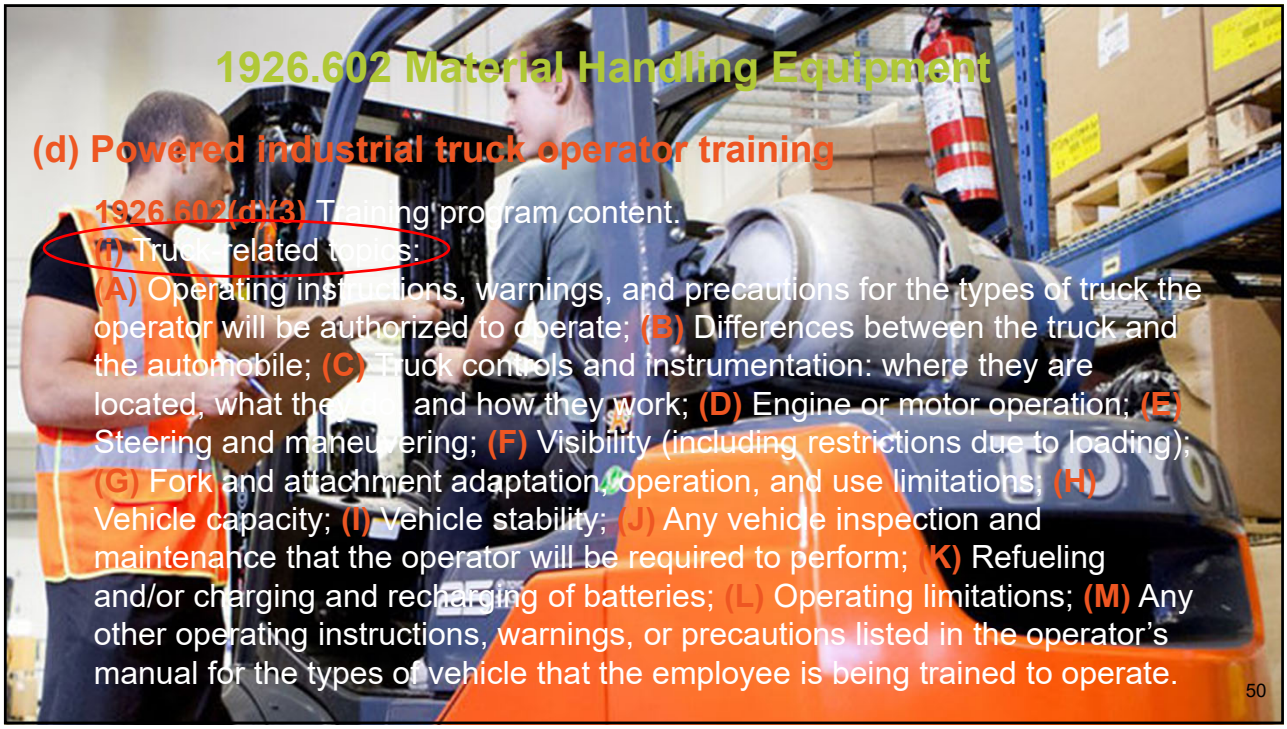
(d) Powered industrial truck operator training

1926.602(d)(3) Training program content.

Powered industrial truck operators shall receive initial training in the following topics, except in topics which the employer can demonstrate are not applicable to safe operation of the truck in the employer's workplace.

49

49



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51

1926.602 Material Handling Equipment

(d) Powered industrial truck operator training

1926.602(d)(3) Training program content.

(iii) The requirements of this section.

Rules adopted under these sections become effective 7 days after filing with the secretary of state.

(By authority conferred on the director of the department of labor and economic opportunity by sections 19 and 21 of the Michigan occupational safety and health act, 1974 PA 154, MCL 408.1019 and 408.1021, and Executive Reorganization Order Nos. 1996-2, 2003-1, 2008-4, 2011-4, and 2019-3, MCL 445.2001, 445.2011, 445.2025, 445.2030, and 125.1998)

R 408.41301 of the Michigan Administrative Code is amended as follows:

PART 13. MOBILE EQUIPMENT

Table of Contents:

52

52

1926.602 Material Handling Equipment

(d) Powered industrial truck operator training

1926.602(d)(4) Refresher training and evaluation.

(i) Refresher training, including an evaluation of the effectiveness of that training, shall be conducted as required by paragraph (l)(4)(ii) to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely.

53

53

1926.602 Material Handling Equipment

(d) Powered industrial truck operator training

1926.602(d)(4) Refresher training and evaluation.

(ii) Refresher training in relevant topics shall be provided to the operator when:

(A) The operator has been observed to operate the vehicle in an unsafe manner; **(B)** The operator has been involved in an accident or near-miss incident; **(C)** The operator has received an evaluation that reveals that the operator is not operating the truck safely; **(D)** The operator is assigned to drive a different type of truck; or **(E)** A condition in the workplace changes in a manner that could affect safe operation of the truck.

54

54

1926.602 Material Handling Equipment

(d) Powered industrial truck operator training

1926.602(d)(4) Refresher training and evaluation.

(iii) An evaluation of each powered industrial truck operator's performance shall be conducted at least once every three years.

55

55

1926.602 Material Handling Equipment

(d) Powered industrial truck operator training

1926.602(d)(5) Avoidance of duplicative training.

If an operator has previously received training in a topic specified in paragraph (l)(3) of this section, and such training is appropriate to the truck and working conditions encountered, additional training in that topic is not required if the operator has been evaluated and found competent to operate the truck safely.

56

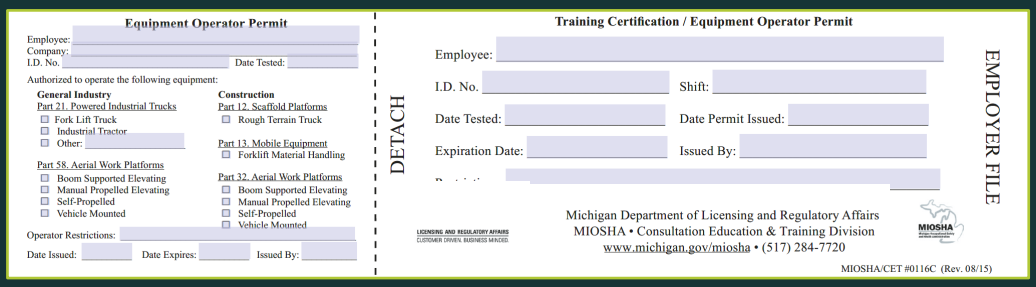
56

1926.602 Material Handling Equipment

(d) Powered industrial truck operator training

1926.602(d)(6) Certification.

The employer shall certify that each operator has been trained and evaluated as required by this paragraph (l). The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.



Equipment Operator Permit

Employee:
Company:
I.D. No. Date Tested:

Authorized to operate the following equipment:

General Industry

Part 21. Powered Industrial Trucks
- ☐ Fork Lift Truck
- ☐ Industrial Tractor
- ☐ Other:

Part 58. Aerial Work Platforms
- ☐ Boom Supported Elevating
- ☐ Manual Propelled Elevating
- ☐ Self-Propelled
- ☐ Vehicle Mounted

Construction

Part 12. Scaffold Platforms
- ☐ Rough Terrain Truck

Part 13. Mobile Equipment
- ☐ Forklift Material Handling

Part 32. Aerial Work Platforms
- ☐ Boom Supported Elevating
- ☐ Manual Propelled Elevating
- ☐ Self-Propelled
- ☐ Vehicle Mounted

Operator Restrictions:

Date Issued: Date Expires: Issued By:

DETACH

Training Certification / Equipment Operator Permit

Employee:
I.D. No. Shift:
Date Tested: Date Permit Issued:
Expiration Date: Issued By:

Michigan Department of Licensing and Regulatory Affairs
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MIOSHA/CET #0116C (Rev. 08/15)

EMPLOYER FILE

57

57

1926.602 Material Handling Equipment

(d) Powered industrial truck operator training

1926.602(d)(7) Dates.
The employer shall ensure that operators of powered industrial trucks are trained, as appropriate, by the dates shown in the following table.

If the employee was hired:	The initial training and evaluation of that employee must be completed:
Before July 30, 2000	By July 30, 2000
After July 30, 2000	Before the employee is assigned to operate a powered industrial truck.
Note: Appendix A—Stability of Powered Industrial Trucks (non-mandatory) maybe referred to—to enhance training. It appears at the end of the standard—Appendix A.	

58

58

1926.602 Material Handling Equipment

(d) Powered industrial truck operator training

1926.602(d)(8) Appendix A to this section provides non-mandatory guidance to assist employers in implementing this paragraph (l). This appendix does not add to, alter, or reduce the requirements of this section.

Appendix A Stability of Powered Industrial Trucks
(Non-mandatory - may be referred to - to enhance training)

59

59

Appendix A Stability of Powered Industrial Trucks
(Non-mandatory - may be referred to - to enhance training)

A-1. Definitions.

A-2. General.

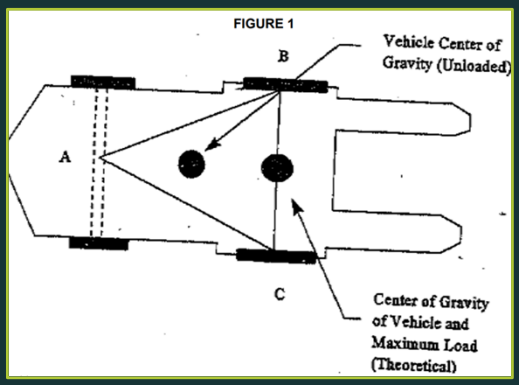
A-3. Basic Principles.

A-4. The Stability Triangle.

A-5. Longitudinal Stability.

A-6. Lateral Stability.

A-7. Dynamic Stability.



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Knowledge Check

1) All motor vehicles in use shall be checked when to assure that parts, equipment, and accessories are in safe operating condition?
2) What is the minimum clearance distance for equipment covered by 1926.600 Equipment when working or being moved in the vicinity of energized power lines?
3) Why use lights or reflectors for unattended equipment, whether at night, adjacent to a highway, or adjacent to in-progress construction areas?
4) All cab glass shall be safety glass that introduces no v_____ d_____ affecting the safe operation of any machine covered by 1926.600 Equipment.
5) Name two conditions for which seat belts need not be provided for earthmoving equipment.

61

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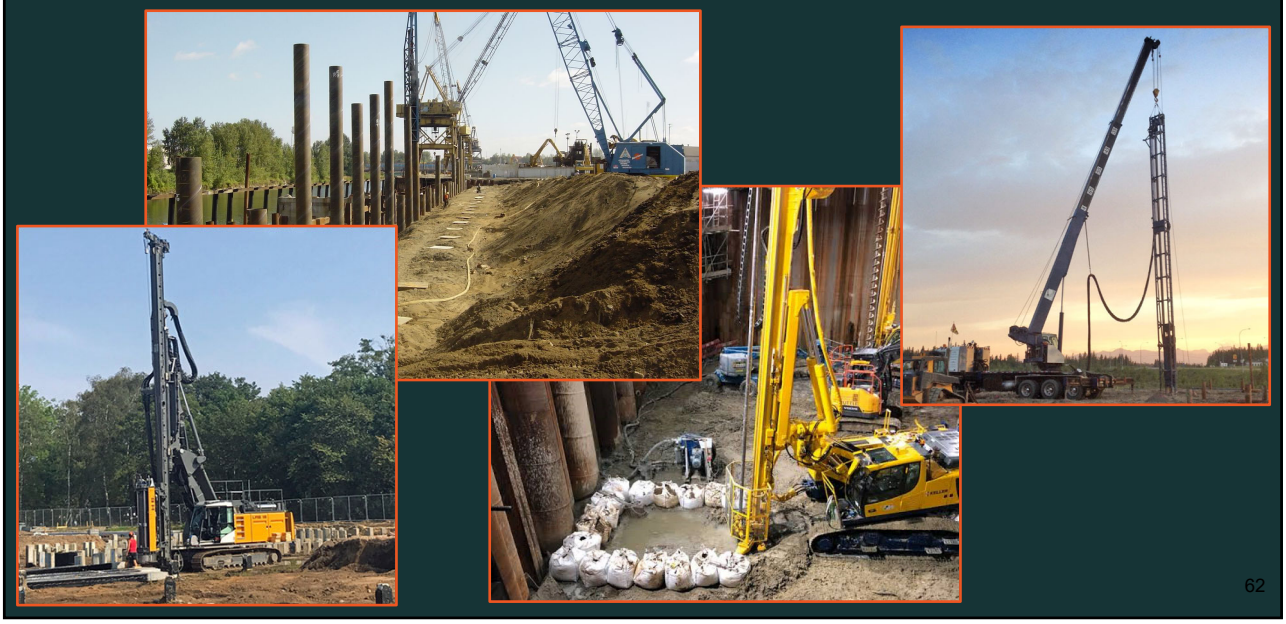
1926.603 Pile Driving Equipment



62

62

1926.603 Pile Driving Equipment

(a) General requirements

1926.603(a)(3) Overhead protection, which will not obscure the vision of the operator, and which meets the requirements of Subpart N of this part, shall be provided. Protection shall be the equivalent of two-inch planking or other solid material of equivalent strength.

*29 CFR Part 1910, Subpart N, Material Handling and Storage

63

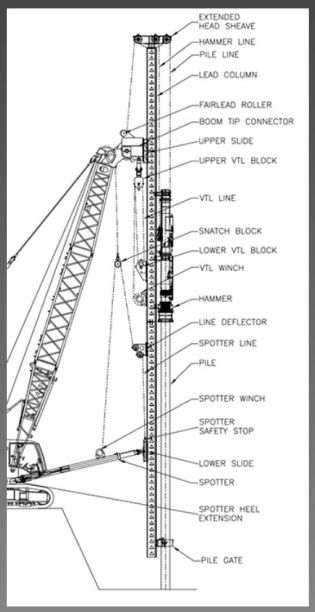
63

1926.603 Pile Driving Equipment

(a) General requirements

1926.603(a)(4) Stop blocks shall be provided for the leads to prevent the hammer from being raised against the head block.

Crane-Mounted Lead Systems



64

64

1926.603 Pile Driving Equipment

(a) General requirements

1926.603(a)(5) A blocking device, capable of safely supporting the weight of the hammer, shall be provided for placement in the leads under the hammer at all times while employees are working under the hammer.

65

65

1926.603 Pile Driving Equipment

(a) General requirements

1926.603(a)(6) Guards shall be provided across the top of the head block to prevent the cable from jumping out of the sheaves.

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1926.603 Pile Driving Equipment

(a) General requirements

1926.603(a)(8) Fixed leads shall be provided with ladder, and adequate rings, or similar attachment points, so that the loft worker may engage his safety belt lanyard to the leads. If the leads are provided with loft platforms(s), such platform(s) shall be protected by standard guardrails.

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1926.603 Pile Driving Equipment

(a) General requirements

1926.603(a)(10) Safety chains, or equivalent means, shall be provided for each hose connection to prevent the line from thrashing around in case the coupling becomes disconnected.

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1926.603 Pile Driving Equipment

(a) General requirements

1926.603(a)(12) Guys, outriggers, thrustouts, or counterbalances shall be provided as necessary to maintain stability of pile driver rigs.

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1926.603 Pile Driving Equipment

(b) Pile driving from barges and floats

1926.603(b) Barges or floats supporting pile driving operations shall meet the applicable requirements of 1926.605.

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1926.603 Pile Driving Equipment

(c) Pile driving equipment

1926.603(c)(2) All employees shall be kept clear when piling is being hoisted into the leads.

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1926.603 Pile Driving Equipment

(c) Pile driving equipment

1926.603(c)(3) When piles are being driven in an excavated pit, the walls of the pit shall be sloped to the angle of repose or sheet-piled and braced.

72

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1926.603 Pile Driving Equipment

(c) Pile driving equipment

1926.603(c)(5) When it is necessary to cut off the tops of driven piles, pile driving operations shall be suspended except where the cutting operations are located at least twice the length of the longest pile from the driver.

73

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1926.603 Pile Driving Equipment

(c) Pile driving equipment

1926.603(c)(6) When driving jacked piles, all access pits shall be provided with ladders and bulkheaded curbs to prevent material from falling into the pit.

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1926.604 Site Clearing

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1926.604 Site Clearing

(a) General requirements

1926.604(a)(1) Employees engaged in site clearing shall be protected from hazards of irritant and toxic plants and suitably instructed in the first aid treatment available.

76

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1926.604 Site Clearing

(a) General requirements

1926.604(a)(2) All equipment used in site clearing operations shall be equipped with rollover guards meeting the requirements of this subpart. In addition, rider-operated equipment shall be equipped with an overhead and rear canopy guard meeting the following requirements:

(i) The overhead covering on this canopy structure shall be of not less than 1/8-inch steel plate or 1/4-inch woven wire mesh with openings no greater than one inch, or equivalent.

(ii) The opening in the rear of the canopy structure shall be covered with not less than 1/4-inch woven wire mesh with openings no greater than one inch.

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1926.605 Marine Operations and Equipment

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1926.605 Marine Operations and Equipment

(a) Material handling operations

1926.605(a)(1) Operations fitting the definition of “material handling” shall be performed in conformance with applicable requirements of Part 1918, “Safety and Health Regulations for Longshoring” of this chapter. The term “longshoring operations” means the loading, unloading, moving, or handling of construction materials, equipment and supplies, etc. into, in, on, or out of any vessel from a fixed structure or shore-to-vessel, vessel-to-shore or fixed structure or vessel-to-vessel.

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1926.605 Marine Operations and Equipment

(b) Access to barges

1926.605(b)(1) Ramps for access of vehicles to or between barges shall be of adequate strength, provided with side boards, well maintained, and properly secured.

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1926.605 Marine Operations and Equipment

(b) Access to barges

1926.605(b)(2) Unless employees can step safely to or from the wharf, float, barge, or river towboat, either a ramp, meeting the requirements of paragraph (b)(1) of this section, or a safe walkway, shall be provided.

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1926.605 Marine Operations and Equipment

(b) Access to barges

1926.605(b)(6) Obstructions shall not be laid on or across the gangway.

1926.605(b)(7) The means of access shall be adequately illuminated for its full length.

82

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1926.605 Marine Operations and Equipment

(b) Access to barges

1926.605(b)(8) Unless the structure makes it impossible, the means of access shall be so located that the load will not pass over employees.

83

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1926.605 Marine Operations and Equipment

(c) Working surfaces of barges

1926.605(c)(2) Decks and other working surfaces shall be maintained in a safe condition.

1926.605(c)(3) Employees shall not be permitted to pass fore and aft, over, or around deckloads, unless there is a safe passage.

84

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1926.605 Marine Operations and Equipment

(d) First-aid and lifesaving equipment

1926.605(d)(2) The employer shall ensure that there is in the vicinity of each barge in use at least one U.S. Coast Guard-approved 30-inch lifering with not less than 90 feet of line attached, and at least one portable or permanent ladder which will reach the top of the apron to the surface of the water. If the above equipment is not available at the pier, the employer shall furnish it during the time that he is working the barge.

85

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1926.605 Marine Operations and Equipment

(d) First-aid and lifesaving equipment

1926.605(d)(3) Employees walking or working on the unguarded decks of barges shall be protected with U.S. Coast Guard-approved work vests or buoyant vests.

86

86

1926.606 Definitions Applicable to This Subpart

(a) “Apron” - The area along the waterfront edge of the pier or wharf.
(b) “Bulwark” - The side of a ship above the upper deck.
(c) “Coaming” - The raised frame, as around a hatchway in the deck, to keep out water.
(d) “Jacob’s ladder” - A marine ladder of rope or chain with wooden or metal rungs.
(e) “Rail” for the purpose of 1926.605, means a light structure serving as a guard at the outer edge of a ship’s deck.

87

87

Rollover Protective Structures (ROPS)

88

88

1926.1000 ROPS for Material Handling Equipment

1926.1000(a) Coverage

Compactors and rubber-tired skid-steer equipment manufactured after July 15, 2019 and all rubber-tired, self-propelled scrapers, rubber-tired front-end loaders, rubber-tired dozers, wheel-type agricultural and industrial tractors used in construction, crawler tractors, crawler-type loaders, and motor graders, with or without attachments that are used in construction work.

Test/Performance Requirements	1926.1000(b) Before July 15, 2019	1926.1000(c) On/After July 15, 2019
Material Handling Equipment in (a) Rollover Protective Structures	1926.1001(b)	1926.1001(c)
Agricultural and Industrial Tractors Rollover Protective Structures	1926.1002(b)	1926.1002(c)
Agricultural and Industrial Tractors Overhead Protection	1926.1003(b)	1926.1003(c)

89

89

1926.1000 ROPS for Material Handling Equipment

1926.1000(d) Remounting

ROPS removed for any reason, shall be remounted with equal quality, or better, bolts or welding as required for the original mounting.

Coverage: Compactors and rubber-tired skid-steer equipment manufactured after July 15, 2019 and all rubber-tired, self-propelled scrapers, rubber-tired front-end loaders, rubber-tired dozers, wheel-type agricultural and industrial tractors, crawler tractors, crawler-type loaders, and motor graders, with or without attachments that are used in construction work.

90

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1926.1000 ROPS for Material Handling Equipment

1926.1000(e) Labeling
Each ROPS shall have the following information permanently affixed to the structure:
(e)(1) Manufacturer or fabricator's name and address;
(e)(2) ROPS model number, if any;
(e)(3) Machine make, model, or series number that the structure is designed to fit.

Coverage: Compactors and rubber-tired skid-steer equipment manufactured after July 15, 2019 and all rubber-tired, self-propelled scrapers, rubber-tired front-end loaders, rubber-tired dozers, wheel-type agricultural and industrial tractors, crawler tractors, crawler-type loaders, and motor graders, with or without attachments that are used in construction work.

91

91

1926.1001 – 1926.1003 Rollover Protective Structures and Overhead Protection

Test/Performance Requirements	Before July 15, 2019	On/After July 15, 2019
1926.1001 Designated Equipment* Rollover Protective Structures	**(b)** Society of Automotive Engineers (SAE)	**(c)** International Organization for Standardization (ISO)
1926.1002 Agricultural and Industrial Tractors Rollover Protective Structures	**(b)** Society of Automotive Engineers	**(c)** International Organization for Standardization
1926.1003 Agricultural and Industrial Tractors Overhead Protection	**(b)** Society of Automotive Engineers	**(c)** International Organization for Standardization

***(a) General:** This section prescribes minimum performance criteria for roll-over protective structures (ROPS) for rubber-tired self-propelled scrapers; rubber-tired front-end loaders and rubber-tired dozers; crawler tractors and crawler-type loaders, motor graders, compactors, and rubber-tired skid steer equipment.

92

92

1926.1002 Protective Frames (ROPS) for Wheel-Type Agricultural and Industrial Tractors Used in Construction

1926.1002(e) Definitions applicable to this section

(e)(1) "Agricultural tractor" means a wheel-type vehicle of more than 20 engine horsepower used in construction work that is designed to furnish the power to pull, carry, propel, or drive implements that are designed for agricultural usage.

93

93

1926.1002 Protective Frames (ROPS) for Wheel-Type Agricultural and Industrial Tractors Used in Construction

1926.1002(e) Definitions applicable to this section

(e)(2) "Industrial tractor" means a wheel-type tractor of more than 20 engine horsepower (other than rubber-tired loaders and dozers described in 1926.1001) used in operations such as landscaping, construction services, loading, digging, grounds keeping, and highway maintenance.

94

94

1926.1003 Overhead Protection for Operators of Agricultural and Industrial Tractors

1926.1003(d) Site clearing
In the case of machines to which 1926.604 (relating to site clearing) also applies, the overhead protection may be either the type of protection provided in 1926.604, or the type of protection provided by this section.

95

95

MIOSHA Accident Investigations Involving Mobile Equipment

96

96

MIOSHA Accident Investigations Involving Mobile Equipment

09/03/2020
Age 49
Caught between
Laborer
Oakland County

A 49-year-old laborer was walking between a dump truck and a stack of swamp mats. The counterweight of a swinging excavator contacted the top mat, pushing it towards the laborer and striking him in the chest.

97

97

MIOSHA Accident Investigations Involving Mobile Equipment

06/04/2020
Age 38
Struck by
Operator
Midland County

A 38-year-old heavy equipment operator was run over by a piece of equipment he was operating.

98

98

MIOSHA Accident Investigations Involving Mobile Equipment

10/25/2019
Age 57
Caught between
Operator
Oakland County

A 57-year-old was operating a sheepsfoot roller. The machine's rear tire slipped over an embankment and tipped onto its side as the operator attempted to climb out. He was caught between the rollover protection structure (ROPS) and the ground.

99

99

MIOSHA Accident Investigations Involving Mobile Equipment

05/23/2019
Age 19
Electrocution
Laborer
Cass County

A 19-year-old general laborer was guiding a metal truss being moved by a forklift which contacted an energized overhead power line during the construction of a hoop barn.

100

100

MIOSHA Accident Investigations Involving Mobile Equipment

05/23/2018
Age 20
Struck by
Asphalt crew
Oakland County

A 20-year-old asphalt paving crew member was struck by a dump truck on site.

101

101

Knowledge Check

1) What is required in order to make modifications to a powered industrial truck which affects its capacity?
2) What is the function of ROPS and what does the acronym mean?
3) Name two U.S. Coast Guard-approved products that must be furnished when working on barges with unguarded decks.
4) What safeguard shall be provided at all times while employees are working under the hammer during pile driving?
5) Powered industrial truck operator training shall consist of a combination of formal instruction, practical training, and evaluation of the operator's performance in the workplace. T or F

102

102

Module 2: Work Zone Safety

103

103

MIOSHA-STD-1318 (03/21)
14 Pages

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DEPARTMENT OF LABOR AND ECONOMIC OPPORTUNITY

DIRECTOR'S OFFICE

CONSTRUCTION SAFETY AND HEALTH STANDARD

Filed with the Secretary of State on July 10, 1978 (as amended January 20, 1982) (as amended November 23, 1982) (as amended June 1, 1995) (as amended July 23, 2001) (as amended November 20, 2006) (as amended April 29, 2013) (as amended January 13, 2014) **(as amended March 30, 2021)**

These rules take effect immediately upon filing with the secretary of state unless adopted under section 33, 44, or 45a(6) of the administrative procedures act of 1969, 1969 PA 306, MCL 24.233, 24.244, or 24.245a.

Rules adopted under these sections become effective 7 days after filing with the Secretary of State.

(By authority conferred on the director of the department of labor and economic opportunity by sections 19 and 21 of the Michigan occupational safety and health act, 1974 PA 154, MCL 408.1019 and 408.1021, and Executive Reorganization Order Nos. 1996-2, 2003-1, 2008-4, 2011-4, and 2019-3, MCL 445.2001, 445.2011, 445.2025, 445.2030, and 125.1998)

R 408.42201 and R 408.42223 of the Michigan Administrative Code are amended, and R 408.42209 is rescinded, as follows:

PART 22. SIGNALS, SIGNS, TAGS, AND BARRICADES

Table of Contents:

R 408.42201 Scope and adopted referenced standards.
Rule 2201. (1) This part pertains to the design, placement, relocation, covering, removal, use, and maintenance of signals, traffic control devices, accident prevention signs, tags, and barricades for construction operations.
(2) American National Standards Institute (ANSI) International Safety Equipment Association (ISEA) standard 107 "High-Visibility Safety Apparel and Headwear," 2004 edition, is adopted by reference in these rules. This standard is available from IHS Global, 15 Inverness Way East, Englewood, Colorado, 80112, USA, telephone number: 1-800-854-7179 or via the internet at website: http://global.ihs.com; at a cost as of the time of adoption of these rules of $64.00.
(3) The "Manual on Uniform Traffic Control Devices, Part 6: Temporary Traffic Control," 2011 Michigan/2009 Federal Edition is adopted by reference in these rules and is available at no cost from the Michigan Department of Transportation via the Internet at website: www.michigan.gov/mdot. The entire 2011 Michigan Manual on Uniform Traffic Control Devices (MMUTCD) may be purchased from the Michigan Department of Transportation, Cashiers Office, P.O. Box 30648, Lansing, Michigan 48909-8148; (517) 636-0650; at a cost of $143.99 as of the time of adoption of these rules.

1

The Standard:

Part 22, Signals, Signs, Tags, and Barricades

as amended March 30, 2021

104

104

Table of Contents

PART 22, SIGNALS, SIGNS, TAGS, AND BARRICADES

Table of Contents:

105

105

408.42201 Scope and Adopted Referenced Standards

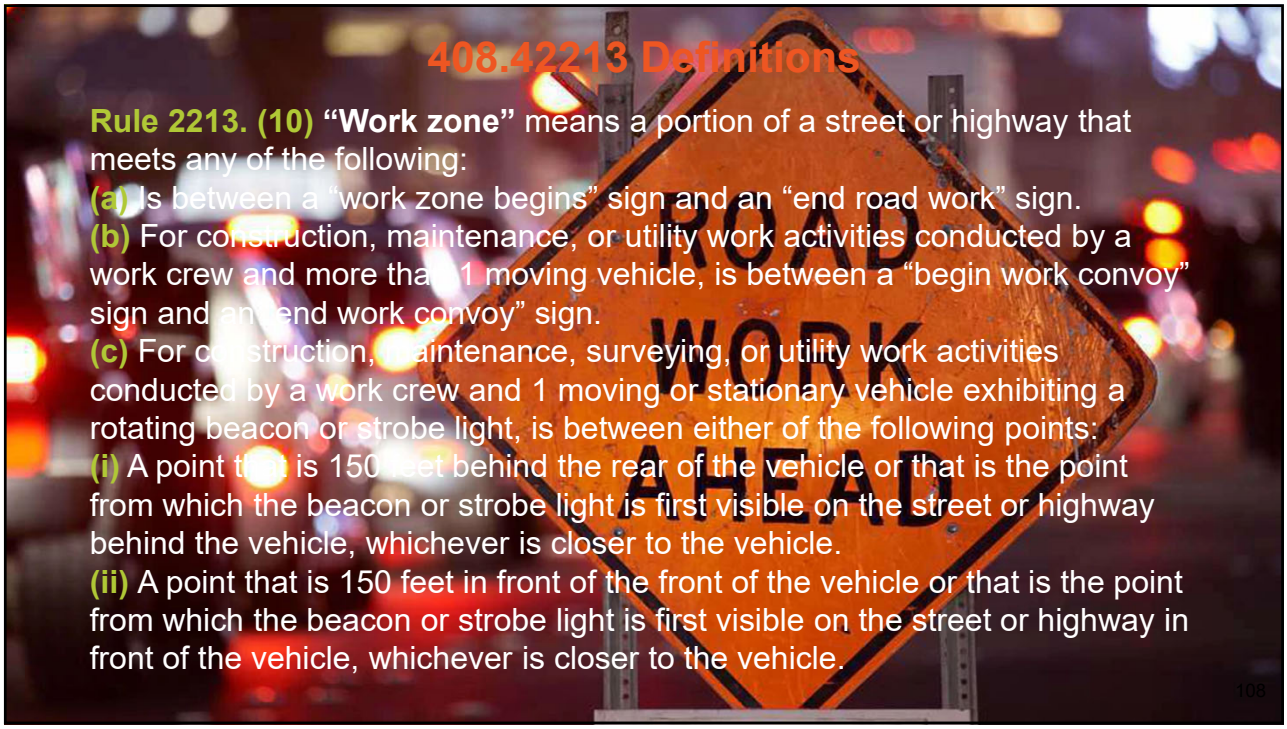
Rule 2201. (1) This part pertains to the design, placement, relocation, covering, removal, use, and maintenance of signals, traffic control devices, accident prevention signs, tags, and barricades for construction operations.

106

106


408.42213 Definitions
Rule 2213. (8) "Traffic control devices" means all signs, signals, markings, and devices placed or erected for the purpose of regulating, warning, and guiding vehicular traffic and for providing employee protection in a work zone.
Rule 2213. (9) "Traffic regulator" means a person who has been trained, properly attired, and equipped to regulate traffic flow to provide employee protection in a work zone.
ROAD
WORK
AHEAD
107

107


408.42213 Definitions
Rule 2213. (10) "Work zone" means a portion of a street or highway that meets any of the following:
(a) Is between a "work zone begins" sign and an "end road work" sign.
(b) For construction, maintenance, or utility work activities conducted by a work crew and more than 1 moving vehicle, is between a "begin work convoy" sign and an "end work convoy" sign.
(c) For construction, maintenance, surveying, or utility work activities conducted by a work crew and 1 moving or stationary vehicle exhibiting a rotating beacon or strobe light, is between either of the following points:
(i) A point that is 150 feet behind the rear of the vehicle or that is the point from which the beacon or strobe light is first visible on the street or highway behind the vehicle, whichever is closer to the vehicle.
(ii) A point that is 150 feet in front of the front of the vehicle or that is the point from which the beacon or strobe light is first visible on the street or highway in front of the vehicle, whichever is closer to the vehicle.
ROAD
WORK
AHEAD
108

108

408.42221 Duties of Employer

Rule 2221. An employer shall provide, install, and maintain signals, signs, barricades, and tags, as prescribed by this part, where an employee might be, or would likely be, injured if not alerted to the hazard.

109

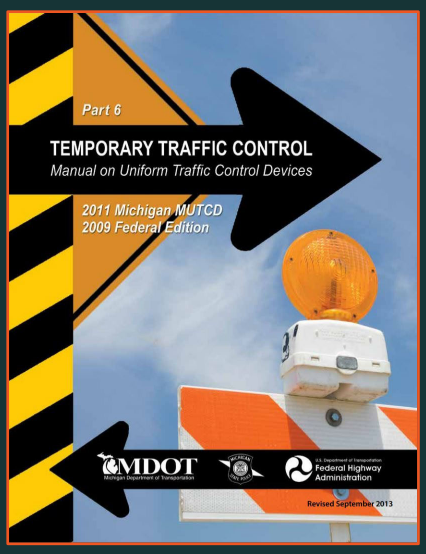
109

408.42223 Traffic Control

Rule 2223. (1) Traffic control devices shall be installed and maintained as prescribed in Part 6 of the 2011 MMUTCD, which is adopted by reference in R 408.42201.

(a) At points of hazard, construction areas shall be posted with legible traffic control signs and protected by traffic control devices.

(b) The design and use of all traffic control devices, including signs, signals, markings, barricades, and other devices for protection of construction workers shall conform to the provisions of Part 6 of the 2011 MMUTCD, which is adopted by reference in R408.42201.



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Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6A.01 General

Standard:
02 The needs and control of all road users through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

Support:
01 Whenever the acronym "TTC" is used in Part 6, it refers to "temporary traffic control."

111

111

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6B.01 Fundamental Principles of Temporary Traffic Control

Standard:
08 Before any new detour or temporary route is opened to traffic, all necessary signs shall be in place.

09 All TTC devices shall be removed as soon as practical when they are no longer needed. When work is suspended for short periods of time, TTC devices that are no longer appropriate shall be removed or covered.

112

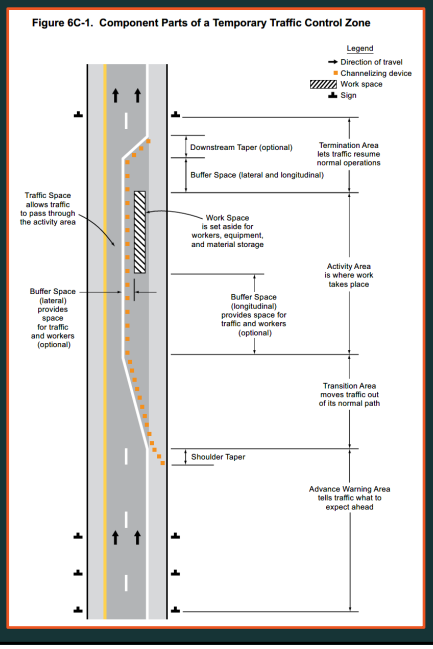
112

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6C.03 Components of Temporary Traffic Control Zones

Support:

01 Most TTC zones are divided into four areas: the advance warning area, the transition area, the activity area, and the termination area. Figure 6C-1 illustrates these four areas. These four areas are described in Sections 6C.04 through 6C.07



113

113

MMUTCD Part 6

Section 6C.04 Advance Warning Area

Support:

01 The advance warning area is the section of highway where road users are informed about the upcoming work zone or incident area.

Section 6C.05 Transition Area

Support:

01 The transition area is that section of highway where road users are redirected out of their normal path. Transition areas usually involve strategic use of tapers, which because of their importance are discussed separately in detail.

Section 6C.06 Activity Area

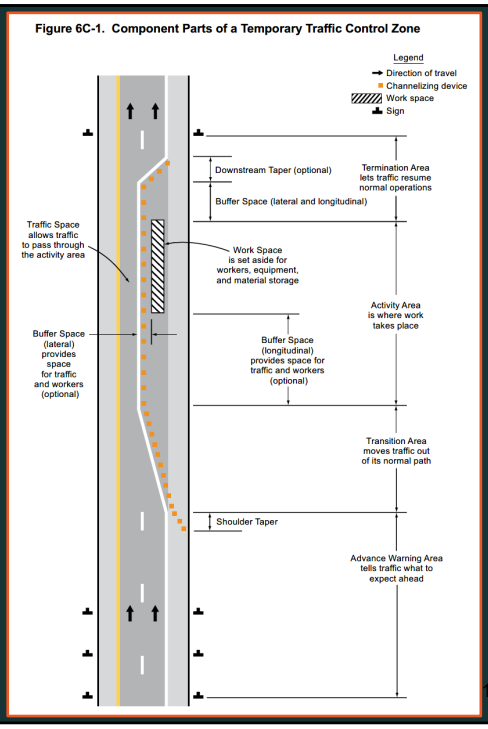
Support:

01 The activity area is the section of the highway where the work activity takes place. It is comprised of the workspace, the traffic space, and the buffer space.

Section 6C.07 Termination Area

Support:

01 The termination area is the section of the highway where road users are returned to their normal driving path. The termination area extends from the downstream end of the work area to the last TTC device such as END ROAD WORK signs, if posted.



114

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Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6C.05 Transition Area

Standard:
02 When redirection of the road users' normal path is required, they shall be directed from the normal path to a new path.

115

115

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6C.10 One-Lane, Two-Way Traffic Control

Standard:
01 Except as provided in Paragraph 5, when traffic in both directions must use a single lane for a limited distance, movements from each end shall be coordinated.

116

116

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6D.03 Worker Safety Considerations

Standard:

04 All workers, including emergency responders, within the right-of-way who are exposed either to traffic (vehicles using the highway for purposes of travel) or to work vehicles and construction equipment within the TTC zone shall wear high-visibility safety apparel that meets the Performance Class 2 or 3 requirements of the ANSI/ISEA 107–2004 publication entitled "American National Standard for High-Visibility Safety Apparel and Headwear" (see Section 1A.11), or equivalent revisions, and labeled as meeting the ANSI 107-2004 standard performance for Class 2 or 3 risk exposure, except as provided in paragraph 5. The person designated by the employer to be responsible for worker safety shall make the selection of the appropriate class of garment.

117

117

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6E.03 Hand-Signaling Devices

Standard:

01 The STOP/SLOW paddle shall be the primary and preferred hand-signaling device because the STOP/SLOW paddle gives road users more positive guidance than red flags.

118

118

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6E.07 Traffic Regulator Procedures

Standard:

02 Flaggers shall use a STOP/SLOW paddle, a flag, or an Automated Flagger Assistance Device (AFAD) to control road users approaching a TTC zone. The use of hand movements alone without a paddle, flag, or AFAD to control road users shall be prohibited except for law enforcement personnel or emergency responders at incident scenes as described in Section 6I.01.

119

119

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6E.08 Traffic Regulator Stations

Standard:

01 Traffic regulator stations shall be located such that approaching road users will have sufficient distance to stop at an intended stopping point.

04 Except in emergency situations, traffic regulator stations shall be preceded by an advance warning sign or signs. Except in emergency situations, traffic regulator stations shall be illuminated at night per MIOSHA General Rule R408.40133.

Table 6E-1. Stopping Sight Distance as a Function of Speed

Speed*	Distance
20 mph	115 feet
25 mph	155 feet
30 mph	200 feet
35 mph	250 feet
40 mph	305 feet
45 mph	360 feet
50 mph	425 feet
55 mph	495 feet
60 mph	570 feet
65 mph	645 feet
70 mph	730 feet
75 mph	820 feet

* Posted speed, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed

120

120

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6F.01 Types of Devices

Standard:

06 Traffic control devices shall be defined as all signs, signals, markings, and other devices used to regulate, warn, or guide road users, placed on, over, or adjacent to a street, highway, private roads open to public travel (see definition in Section 1A.13), pedestrian facility, or bikeway by authority of a public body or official having jurisdiction.

07 All traffic control devices used for construction, maintenance, utility, or incident management operations on a street, highway, or private road open to public travel (see definition in Section 1A.13) shall comply with the applicable provisions of this Manual.

121

121

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6F.08 ROAD (STREET) CLOSED Sign (R11-2)

Standard:

04 The ROAD (STREET) CLOSED sign shall not be used where road user flow is maintained through the TTC zone with a reduced number of lanes on the existing roadway or where the actual closure is some distance beyond the sign.

122

122

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6F.15 Special Regulatory Signs

Standard:
02A The WORK ZONE BEGINS (R5-18c) sign defines the beginning of a work zone.

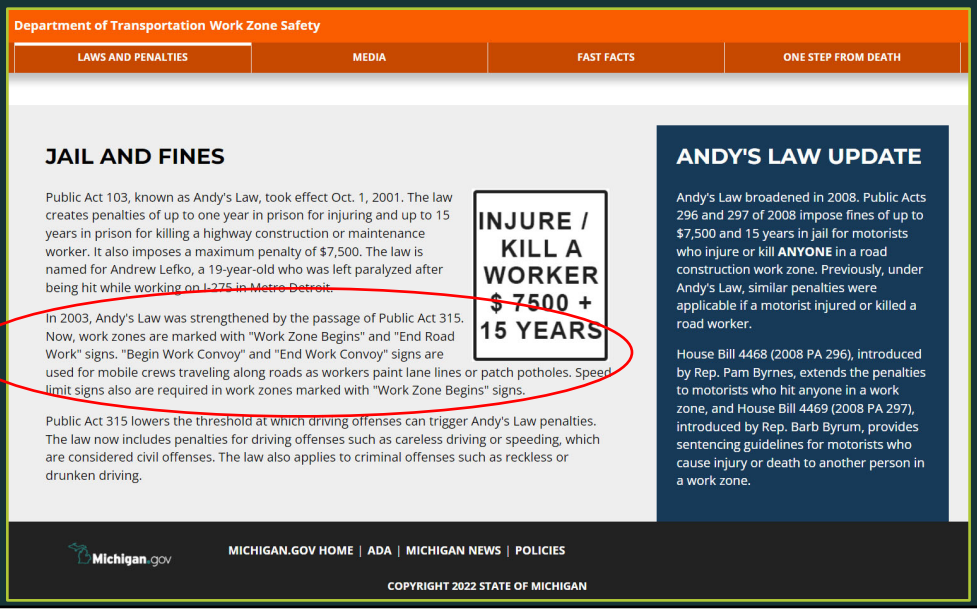
Section 6F.57 END ROAD WORK Sign (G20-2)

Standard:
02A The END ROAD WORK (G20-2) sign defines the end of a work zone per Section 257.79d(a) of the "Michigan Vehicle Code."

123

123

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6



124

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Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6F.63 Channelizing Devices

Standard:

01 Designs of various channelizing devices shall be as shown in Figure 6F–7. All channelizing devices shall be crashworthy.

125

125

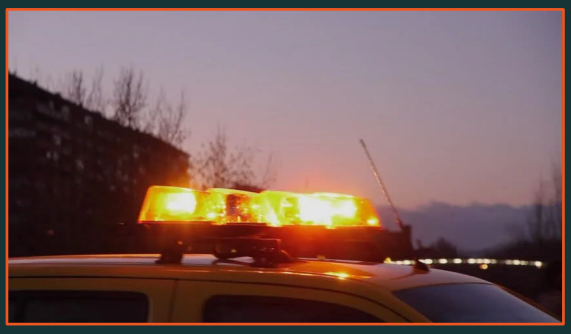
Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6F.81 Lighting Devices

Standard:

05 Although vehicle hazard warning lights are permitted to be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights, they shall not be used instead of high-intensity rotating, flashing, oscillating, or strobe lights.

Per Section 257.698 of the "Michigan Vehicle Code" the color of high-intensity rotating, flashing, oscillating, or strobe lights shall be amber.



126

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Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6G.02 Work Duration

Standard:

02 The five categories of work duration and their time at a location shall be:

A. Long-term stationary is work that occupies a location more than three days.
B. Intermediate-term stationary is work that occupies a location more than one daylight period up to three days, or nighttime work lasting more than one hour.
C. Short-term stationary is daytime work that occupies a location for more than one hour within a single daylight period.
D. Short duration is work that occupies a location up to one hour.
E. Mobile is work that moves intermittently or continuously.

127

127

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6G.02 Work Duration

Guidance:

10 Safety in short-duration or mobile operations should not be compromised by using fewer devices simply because the operation will frequently change its location.

Option:

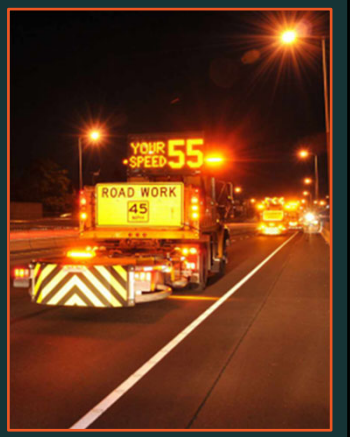
11 Appropriately colored or marked vehicles with high-intensity rotating, flashing, oscillating, or strobe lights may be used in place of signs and channelizing devices for short-duration or mobile operations. These vehicles may be augmented with signs or arrow boards.

Support:

12 During short-duration work, it often takes longer to set up and remove the TTC zone than to perform the work. Workers face hazards in setting up and taking down the TTC zone. Also, since the work time is short, delays affecting road users are significantly increased when additional devices are installed and removed.

Option:

13 Considering these factors, simplified control procedures may be warranted for short-duration work. A reduction in the number of devices may be offset by the use of other more dominant devices such as high-intensity rotating, flashing, oscillating, or strobe lights on work vehicles.



128

128

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6G.03 Location of Work

Standard:

03 When the workspace is within the traveled way, except for short-duration and mobile operations, advance warning shall provide a general message that work is taking place and shall supply information about highway conditions. TTC devices shall indicate how vehicular traffic can move through the TTC zone.

Support:

02 The choice of TTC needed for a TTC zone depends upon where the work is located. As a general rule, the closer the work is to road users, the greater the number of TTC devices that are needed. Procedures are described later in this Chapter for establishing TTC zones in the following locations:

A. Outside the shoulder,
B. On the shoulder with no encroachment,
C. On the shoulder with minor encroachment,
D. Within the median, and
E. Within the traveled way.

129

129

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6G.07 Work on the Shoulder with No Encroachment

Standard:

02 When paved shoulders having a width of eight feet or more are closed, at least one advance warning sign shall be used. In addition, channelizing devices shall be used to close the shoulder in advance to delineate the beginning of the workspace and direct motor vehicle traffic to remain within the traveled way.

130

130

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6G.12 Work Within the Traveled Way of a Multi-Lane, Non-Access Controlled Highway

Standard:

03 When a lane is closed on a multi-lane road for other than a mobile operation, a transition area containing a merging taper shall be used.

131

131

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6G.15 Two-Lane, Two-Way Traffic on One Roadway of a Normally Divided Highway

Standard:

02 When two-lane, two-way traffic control must be maintained on one roadway of a normally divided highway, opposing vehicular traffic shall be separated with either temporary traffic barriers (concrete safety-shape or approved alternate), channelizing devices, or a temporary raised island throughout the length of the two-way operation. The use of markings and complementary signing, by themselves, shall not be used.

132

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6F.77 Pavement Markings

Standard:

04 For long-term stationary operations, pavement markings in the temporary traveled way that are no longer applicable shall be removed or obliterated as soon as practical. Pavement marking obliteration shall remove the non-applicable pavement marking material, and the obliteration method shall minimize pavement scarring. Painting over existing pavement markings with black paint or spraying with asphalt shall not be accepted as a substitute for removal or obliteration.

133

133

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

Section 6F.78 Temporary Markings

Standard:

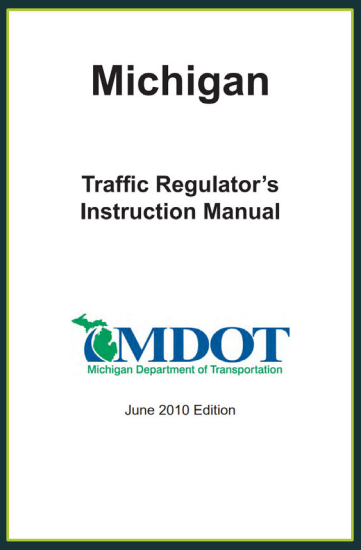
04 Warning signs, channelizing devices, and delineation shall be used to indicate required road user paths in TTC zones where it is not possible to provide a clear path by pavement markings.

134

134

Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Part 6

All Traffic Regulators must review the training requirements described in the current edition of the Michigan Manual on Uniform Traffic Control Devices Part 6, Chapter 6E, prior to performing work.



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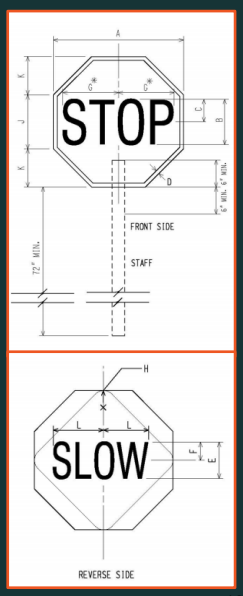
135

408.42223 Traffic Control

Rule 2223. (2) A hand-held paddle sign shall have two faces and it shall be attached to a staff of suitable design that will allow the entire unit to be held and controlled by one traffic regulator.

- Minimum six feet above roadway to sign bottom
- Sign fastened to staff without obscuring legend
- Staff within face of sign colored to match
- Sign not less than 18 inches x 18 inches
- Lettering not less than six inches high
- Lettering and spacing per MMUTCD Part 6, 2011
- Legend optically centered
- One side shall display "STOP"; the other shall display "SLOW"
- One regulator stopping two directions, both shall display "STOP"



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408.42223 Traffic Control

Rule 2223. (4) An employer shall provide, and a traffic regulator shall wear, high-visibility safety apparel that meets the Performance Class 2 or 3 requirements of the ANSI/ISEA 107, "High-Visibility Safety Apparel and Headwear," 2004 edition, (see Section 1A.11), which is adopted by reference in R 408.42201, or equivalent revisions, and labeled as meeting the ANSI 107-2004 standard performance for Class 2 or 3 risk exposure.

137

137

408.42223 Traffic Control

Rule 2223. (5) A traffic regulator shall also wear head, eye, and foot protection as prescribed in Construction Standard Part 6, Personal Protective Equipment, as referenced in R 408.42201.

138

138

408.42224 Barricades for Construction Operations on Other Than Public Right-of-Way

Rule 2224. A barricade shall be provided to obstruct or direct an employee from a hazardous area of a construction operation not otherwise affected by another standard.

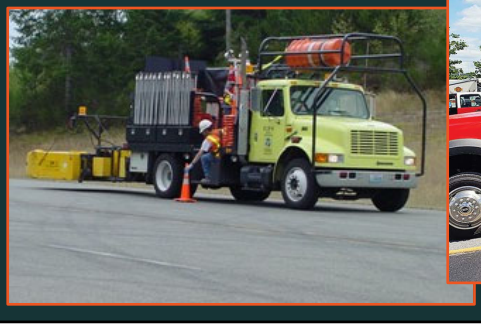
"Barricade" means a readily visible obstruction used to direct the passage of employees or vehicles.

139

139

408.42225 Placement, Removal, Relocation, and Use of Traffic Control Devices from a Moving Vehicle; Handholds

Rule 2225. (1) Construction and maintenance operations that require placement, relocation, or removal of pavement markings, or traffic control devices such as drums, barricades, cones, or signs, shall provide protection to an employee by any of the following methods:



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408.42225 Placement, Removal, Relocation, and Use of Traffic Control Devices from a Moving Vehicle; Handholds
Rule 2225. (1) Construction and maintenance operations that require placement, relocation, or removal of pavement markings, or traffic control devices such as drums, barricades, cones, or signs, shall provide protection to an employee by any of the following methods:
(a) Use of a seat and a seatbelt that shall be worn.
(b) A standard guardrail system as prescribed in Construction Standard Part 45, Fall Protection, R 408.44501, as referenced in R 408.42209, which adopts C.F.R. §1926.502 et seq. by reference.
(c) A guardrail as described in subdivision (b) of this subrule may be modified by removing a section of the guardrail at the point of operation to facilitate the handling of traffic control devices, such as barrels, cones, or pavement markers. A hand hold shall be provided.
141

141


408.42225 Placement, Removal, Relocation, and Use of Traffic Control Devices from a Moving Vehicle; Handholds
Rule 2225. (1) Construction and maintenance operations that require placement, relocation, or removal of pavement markings, or traffic control devices such as drums, barricades, cones, or signs, shall provide protection to an employee by any of the following methods:
(d) When placing or removing traffic control devices from a lower work platform, any combination of top rails, mid rails, side rails, seats, toe boards, or other combination of equivalent safeguards provided to the employee shall be used. A handhold shall be provided.
(e) Use of a positioning fall protection system that prevents the employee from falling from the vehicle. A handhold shall be provided.
(f) Use of other means that will provide equivalent fall protection for an employee may be used. Such a system shall be performance oriented and shall be designed so that it does not create a greater hazard to the employee.
142

142

408.42225 Placement, Removal, Relocation, and Use of Traffic Control Devices from a Moving Vehicle; Handholds

Rule 2225. (2) A handhold shall be oriented and a size to promote gripping by wrapping fingers around not less than 270 degrees (three sides) of the device or place designated. The handhold shall be capable of withstanding not less than 200 pounds of force in any direction and be free from rough edges, slippery surfaces, or hazardous projections. The handhold shall be in place and identified as such before employees are permitted to perform their assigned tasks while riding on moving vehicles.

143

143

408.42233 Danger Sign

Rule 2233. (1) A danger sign to alert employees shall be used where an immediate hazard exists. The sign shall be removed when the hazard no longer exists.

Rule 2233. (4) An employee shall be instructed that a danger sign indicates immediate danger and that special precautions are necessary.

144

144

408.42234 Caution Sign

Rule 2234. (1) A caution sign shall be used to warn of a potential hazard or to caution against an unsafe practice.

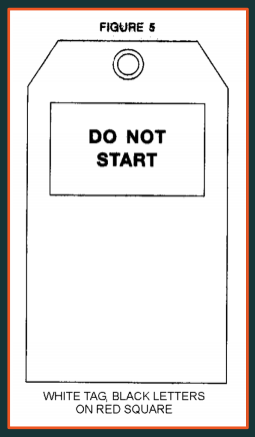
Rule 2234. (4) An employee shall be instructed that a caution sign indicates a possible hazard and that proper precautions shall be taken.

145

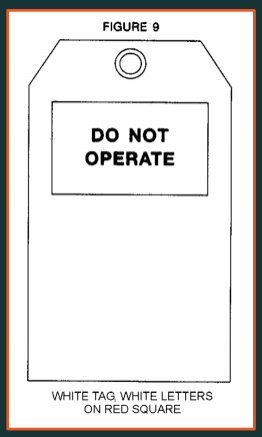
145

408.42242 Accident Prevention Tags; Types; Use and Specifications

Rule 2242. (1) A "Do Not Start" tag shall be attached to the starting mechanism of equipment that would cause a hazardous condition if activated. The background color shall be white with black lettering on a red square. (See figure 5.)



Rule 2242. (5) A "Do Not Operate" tag shall be used to warn of potential hazard if use of the equipment would create a hazard. The background color shall be white with black lettering on a red square. (See figure 9.)

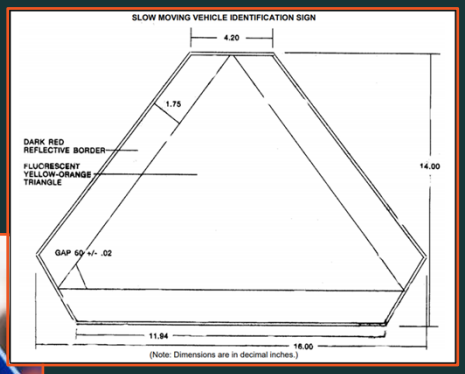


146

146

408.42243 Signs for Slow-Moving Vehicles

Rule 2243. A sign as prescribed in this rule shall be attached to the rear of any vehicle that, by design, moves at 25 miles per hour or less on any public, private, or temporary road.



147

147

MIOSHA Accident Investigations Involving Work Zones

148

148

MIOSHA Accident Investigations Involving Work Zones

01/13/2021
Age 56
Struck by
Traffic Regulator
Iron County

A driver did not stop for the work zone and pinned a 56-year-old flagger between two vehicles.

149

149

MIOSHA Accident Investigations Involving Work Zones

11/07/2020
Ages 23, 23
Struck by
Laborers
Wayne County

During a road construction operation while working in a lane closure, two 23-year-old laborers were installing epoxy and dowel bars when a vehicle drove through five open patches killing the two laborers.

150

150

MIOSHA Accident Investigations Involving Work Zones

09/24/2020
Age 40
Struck by
Superintendent
Eaton County

A 40-year-old project superintendent was inspecting and measuring for future road work when he was struck by a vehicle.

151

151

MIOSHA Accident Investigations Involving Work Zones

09/21/2020
Age 26
Struck by
Laborer
Macomb County

A 26-year-old laborer was sent to repair a manhole and replace the cover when he was struck by a passing vehicle.

152

152

MIOSHA Accident Investigations Involving Work Zones

09/30/2019
Age 54
Struck by
Operator
Ionia County

A 54-year-old operator was struck by a vehicle when working at night in a freeway construction zone. The victim passed away from his injuries.

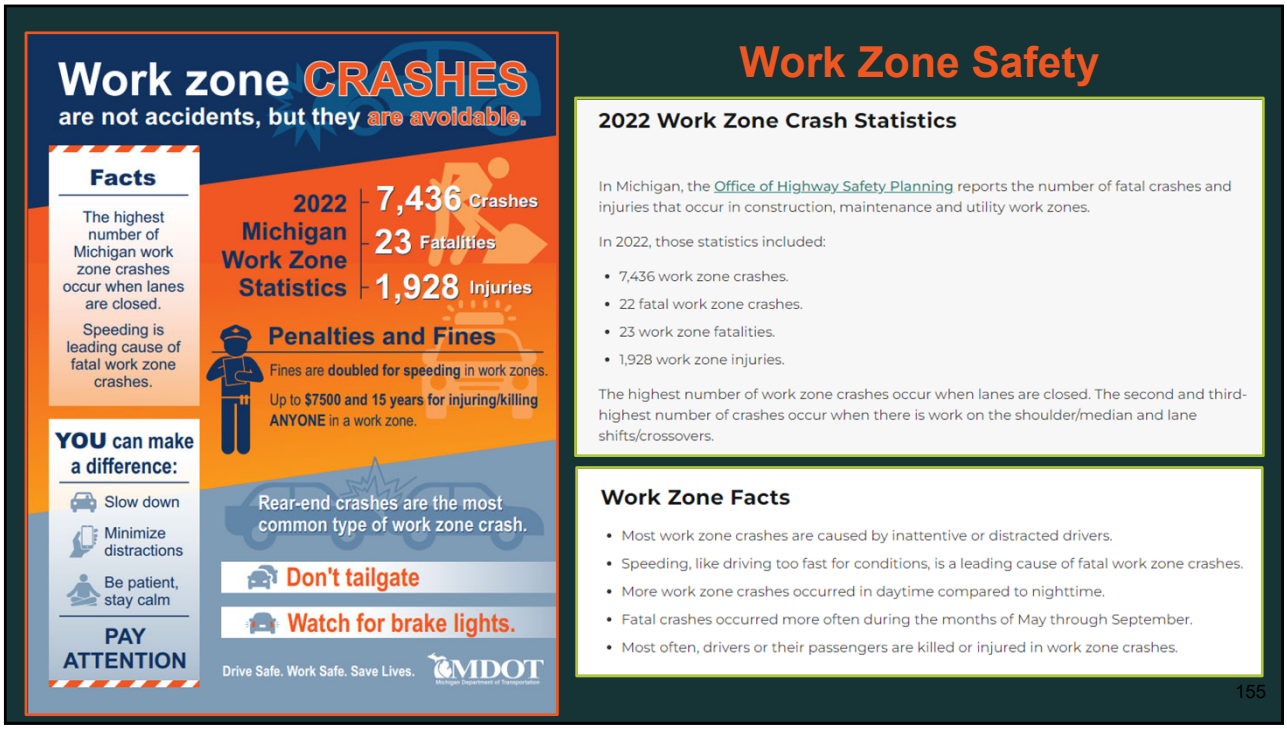
153

153

- Work zones are a fact of life
- Work zones do not have to be a factor of death

- Andre Glen Alvesteffer, 20
- September 25, 2018 - Bear Lake, MI

154


Work zone CRASHES
are not accidents, but they are avoidable.
Facts
The highest number of Michigan work zone crashes occur when lanes are closed.
Speeding is leading cause of fatal work zone crashes.
YOU can make a difference:
Slow down
Minimize distractions
Be patient, stay calm
PAY ATTENTION
2022 Michigan Work Zone Statistics
7,436 Crashes
23 Fatalities
1,928 Injuries
Penalties and Fines
Fines are doubled for speeding in work zones.
Up to $7500 and 15 years for injuring/killing ANYONE in a work zone.
Rear-end crashes are the most common type of work zone crash.
Don't tailgate
Watch for brake lights.
Drive Safe. Work Safe. Save Lives.
MDOT
Work Zone Safety
2022 Work Zone Crash Statistics
In Michigan, the Office of Highway Safety Planning reports the number of fatal crashes and injuries that occur in construction, maintenance and utility work zones.
In 2022, those statistics included:
7,436 work zone crashes.
22 fatal work zone crashes.
23 work zone fatalities.
1,928 work zone injuries.
The highest number of work zone crashes occur when lanes are closed. The second and third-highest number of crashes occur when there is work on the shoulder/median and lane shifts/crossovers.
Work Zone Facts
Most work zone crashes are caused by inattentive or distracted drivers.
Speeding, like driving too fast for conditions, is a leading cause of fatal work zone crashes.
More work zone crashes occurred in daytime compared to nighttime.
Fatal crashes occurred more often during the months of May through September.
Most often, drivers or their passengers are killed or injured in work zone crashes.
155

155


2024 National Work Zone Awareness Week
Work Zones are temporary.
Actions behind the wheel can last forever.
NWZAW
National Work Zone Awareness Week
NWZAW
April 15 – 19, 2024

156

Knowledge Check

1) MMUTCD is the acronym for what MI Department of Transportation document adopted by MIOSHA in Part, 22?
2) Workers are never permitted to lean out of a moving vehicle while placing cones on the road. T or F
3) Who within the TTC zone shall wear Class 2 or Class 3 apparel when working in the right-of-way exposed to traffic?
4) List three specifics to be worn by traffic regulators as prescribed in Part, Personal Protective Equipment?
5) Hand movements alone to control road users is prohibited except for law enforcement or emergency responders at incident scenes. T or F

157

157

Summary

- Wear seat belts that meet MIOSHA Standards except on equipment that is designed only for standup operation or that has no rollover protective structure
- Check vehicles before each shift to assure that all parts and accessories are in safe operating condition
- Always maintain safe operating speeds of all vehicles
- Do not drive a vehicle in reverse gear with an obstructed view unless it has an audible reverse alarm or another worker signals that it is safe to do so
- Drive vehicles or equipment only on roadways/grades that are safely constructed and maintained
- Make sure that all personnel are in the clear before using dumping or lifting devices
- Lower or block bulldozer and scraper blades, loader buckets, dump bodies, etc when not in use and leave all controls in neutral position
- Set parking brakes when vehicles and equipment are parked and chock the wheels if on an incline
- All vehicles must have adequate braking systems and other safety devices
- Haulage vehicles that are loaded by cranes, power shovels, loaders, etc must have an overhead shield or canopy that protects the driver from falling material
- Do not exceed a vehicle's rated load or lifting capacity
- Do not carry personnel unless there is a safe place to ride
- Use traffic signs, barricades, and/or traffic regulators when construction takes place near public roadways
- All workers within the right-of-way exposed to traffic or to work vehicles and construction equipment within the TTC zone shall wear Class 2 or Class 3 safety apparel
- Equipment should always maintain a minimum 10 feet of clearance from energized electrical lines
- **Train all workers!** (operators, laborers, spotters, traffic regulators, trainers, management, etc)

158

Resources

MIOSHA CS Part 13, Mobile Equipment
Link

MIOSHA CS Part 22, Signals, Signs, Tags, and Barricades
Link

MIOSHA Fact Sheet Struck-By: Vehicle and Equipment
Link

Michigan Manual on Uniform Traffic Control Devices Part 6 2011
Link

MDOT Traffic Regulator's Instruction Manual
Link

MDOT Work Zone Safety homepage
Link

159

159

Assessment

- The purpose of the assessment is to validate the knowledge learned in class
- A passing score is 70% or higher
- Using reference materials is not allowed during the assessment
- Collaboration/discussion with others is not allowed during the assessment
- Answers may be reviewed upon completion by all participants

160

160

MIOSHA MTI Course Survey

MIOSHA
Michigan Occupational Safety and Health Administration

161

CONSTR Part 13. Mobile Equipment and Work Zone Safety

Student Resources

MIOSHA Standards:

MIOSHA CS Part 13. Mobile Equipment

MIOSHA CS Part 22. Signals, Signs, Tags, and Barricades

MIOSHA Fact Sheets:

MIOSHA Fact Sheet Rough Terrain Fork Trucks

MIOSHA Fact Sheet Struck-By: Vehicle and Equipment

MIOSHA Resource:

Sample Powered Industrial Truck Operator Permits

Other Resources:

MDOT Michigan Manual on Uniform Traffic Control Devices Part 6 2011

MDOT Traffic Regulator's Instruction Manual

MDOT Work Zone Safety homepage

MIOSHA Training Institute (MTI) Resources:

www.michigan.gov/mti

MIOSHA Training Calendar:

www.michigan.gov/mioshatraining

MIOSHA Homepage:

www.michigan.gov/miosha

Michigan Department of Labor and Economic Opportunity
Michigan Occupational Safety and Health Administration
Consultation Education and Training Division
525 W Allegan St, PO Box 30643
Lansing, Michigan 48909-8143

For more information or to request consultation, education, and training services
call 517-284-7720
or
visit our website at www.michigan.gov/miosha

www.michigan.gov/leo