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# Ferris State University Industrial Vehicles Safety Procedure

Pedestrian and Vehicle Safety



**FERRIS STATE UNIVERSITY**

SAFETY, HEALTH, ENVIRONMENTAL AND RISK MANAGEMENT

**TABLE OF CONTENTS**

1. Purpose _____	2
2. Scope _____	2
3. Responsibilities _____	2
a. Employees	
b. Department / Instructor/ Supervisor Responsibilities	
c. Environmental Health and Safety Responsibilities	
4. Compliance and Time Allowed for Implementation _____	3
5. Training and Evaluation _____	3
6. Safe Operation of Industrial Vehicle _____	4
7. Pedestrian Behavior and Vehicle Interaction _____	6
8. Layout and Conditions for Safe Vehicle Operations _____	6
9. Loading Dock Design, Operation, and Use _____	7
10. Risk Assessment _____	8
11. (Examples) Traffic Management and Floor Marking Guidelines _____	8
Appendix A. _____	11
Appendix B. _____	13

## **1. PURPOSE**

- a. To define the workplace organization which allows for the safe movement of pedestrians and industrial vehicles (forklifts, equipment with fork attachments, etc.) at all Ferris State University locations.
- b. To establish safety equipment requirements for shipping and receiving facilities and dock operations.
- c. This standard establishes requirements in the following areas:
  - i. Safe operation of industrial vehicles
  - ii. Pedestrian behavior and vehicle interaction
  - iii. Loading bay design, equipment and operation
  - iv. Plant conditions required for safe vehicle operation (including designated separation of Pedestrians and Vehicles)
  - v. Training and supervision of vehicle operators

## **2. SCOPE**

- a. This standard applies to Ferris State University operations and departments including activities such as warehouses, maintenance shops, or any other operation that uses mechanically powered industrial vehicles.
- b. By default, all equipment and locations are included in this standard. A specific vehicle or location may be considered for exemption only with the written approval of the Safety Health Environmental & Risk Management Office. For exemption, it must be demonstrated that the standard is impractical and that a satisfactory Risk Assessment, together with completed containment actions have been carried out and recorded.

## **3. RESPONSIBILITIES**

- a. Employees
  - i. All employees are required to conform to these standards and to help ensure that the practices and procedures of this Standard are met.
  - ii. If any safety issue arises, they must report to their supervisor immediately.
- b. Department/Instructor/Supervision
  - i. It is the supervisors' responsibility to understand and consistently enforce the work rules arising from the requirements of this Standard.
  - ii. It is the ultimate responsibility of the department manager to ensure and facilitate compliance with this standard and any local requirements (state and federal standards).

- iii. Most aspects of safe forklift and pedestrian movements involve the behaviors of forklift operators and pedestrians. Therefore, the departments shall ensure there is a robust safety process in place to adequately protect all employees, visitors implement actions which facilitate the change from at-risk behaviors to safe behaviors.
- c. Environmental Health and Safety
  - i. It is the SHERM Office responsibility to know this Standard and any applicable state and federal standards, determine any gaps in compliance, and recommend actions to correct such gaps.

#### **4. COMPLIANCE AND TIME ALLOWED FOR IMPLEMENTATION:**

- a. Any regulatory non-compliance identified during a risk assessment or site inspection shall be corrected.
- b. Vehicle operators and pedestrians shall be trained and certified to this standard and to any local statutory requirements.
- c. Risk assessment of vehicle / pedestrian separation shall be implemented and carried out by the Department with assistance by SHERM.

#### **5. TRAINING & EVALUATION**

- a. At minimum, state regulatory requirements for industrial vehicle operator training and certification/licensing must be met. In addition, the following training program elements shall be met:
  - i. Each operator shall be determined to be physically capable of safely operating the vehicle to which they are assigned. The operator shall have corrected vision that meets the same requirements as those for a valid State of Michigan driver's license.
  - ii. Each operator shall be determined competent as demonstrated by the successful completion of a formal training event and evaluation prior to being permitted to operate a powered industrial vehicle (except when under the direct supervision of an experienced trainer during the training event).
  - iii. Training shall consist of a combination of formal instruction, practical training, and evaluation of the operator's performance in the workplace.
  - iv. All training shall be conducted by persons who have the knowledge, training and experience to train operators and evaluate their competence.
  - v. At a minimum, the formal instruction and practical training shall include the following:
    - 1. Operating instructions and warnings for the type and class of vehicle the operator will operate

2. Controls and instrumentation, what they do and how they work
  3. Steering and maneuvering
  4. Visibility issues
  5. Fork and attachment adaptation, operation and use limitations
  6. Vehicle capacity, stability, and operational limitations
  7. Inspection and maintenance that the operator will be required to perform
  8. Refueling and/or charging batteries
  9. Composition of loads to be carried and load stability; load manipulation, stacking and unstacking
  10. Hazardous locations where the vehicle may be operated, including areas where carbon monoxide can accumulate.
- b. The operator's performance shall be evaluated every 3 years following the initial training to ensure that the operator has maintained the necessary knowledge and skills.
  - c. Refresher training shall be conducted when: the operator has been observed to operate the vehicle in an unsafe manner; involved in an incident, or if his/her 3 year evaluation reveals a loss of knowledge or skill.

## **6. SAFE OPERATION OF INDUSTRIAL VEHICLES**

- a. Only employees holding a current certification/permit which complies with all state and federal regulatory requirements and has been formally approved and registered by Ferris State University are allowed to operate any powered industrial vehicle on Ferris State University premises. The certification/permit shall be readily available upon asking by a supervisor, manager or safety administrator the operator shall comply at all times that they are operating an industrial vehicle. *(This certification also applies to contractors unless they operate in isolated locations with no interaction with Ferris State University employees).*
- b. Records shall be maintained for each vehicle operator and include: classes of vehicle and equipment individual certified in; training details including date, refresher requirements, expiration date, etc.; and, details of disciplinary actions related to driving behaviors.
- c. Industrial vehicle work rules for operators:
  - i. At the beginning of each work shift, a maintenance inspection checklist must be completed and documented to ensure safe operability of the vehicle.
  - ii. Seat belts and other operator restraints shall be utilized according to state and federal regulatory requirements.
  - iii. Speed limits established by local management must be observed. In addition, the speed of industrial vehicles must not exceed a brisk walking pace when pedestrians are near.

- iv. Always drive at a speed which allows for the safe stopping of the vehicle allowing for all conditions present including:
  - 1. Weight and stability of the load: heavy loads will increase the minimum stopping distance; unstable loads may require a gentle braking action which increases the stopping distance.
  - 2. Floor conditions: uneven or slippery floors (including ramps, bridge plates, etc.) increase stopping distances
  - 3. Poor Visibility: low lighting, glare, smoke, blind corners, load, obstructions all reduce the time available for an operator to react.
  - 4. Other vehicles: when approaching each other, the relative speeds and required stopping distances are doubled
  - 5. Pedestrians may behave erratically, change direction rapidly and unexpectedly, may be distracted.
- v. All traffic management rules such as stop signs, one-way, give way, etc. shall be obeyed.
- vi. The service horn must be sounded when approaching pedestrian and when approaching intersections or corners where the visibility is poor.
- vii. When approaching a pedestrian, sound the service horn, allow safe clearance, and use "STOP" and "GO AHEAD" hand signals to communicate who will proceed first.
- viii. If stopping a vehicle to talk to a pedestrian the "Arm's Length Rule" (2-foot rule) shall be enforced. This rule requires a vehicle operator to maintain a minimum distance of an outstretched arm (2'/0.6m) between the vehicle and any pedestrian. For all fork lifts, the load must be completely lowered, the hand brake applied and the power turned off before any pedestrian is allowed closer than an arm's length to the vehicle. An operator may not start the vehicle's motor until the pedestrian is at least an arm's reach away from the vehicle and is aware that it will be moving.
- ix. When in motion, fork position must be within 4-6" off the ground. If forks are required to be raised to manipulate load, avoid obstacles etc, only creep travel speed is allowed.
- x. If the load obscures the forward view, drive in reverse or reduce load height. If short distance forward maneuvers [less than (32')] are necessary, use a second person to guide operator and ensure a clear path.
- xi. Maintain contact with the brake when approaching a pedestrian or intersection.
- xii. Do not allow anyone to ride on or in the vehicle unless designed and approved for that purpose.
- xiii. Do not operate any powered industrial truck in a designated "pedestrian only" area except in exceptional circumstances.
- xiv. Avoid creating blind corners and intersections due to stacking tall piles of stock at these locations. Blind corners should be taken as 'wide' as

reasonably practical while avoiding encroaching into other vehicle or pedestrian lanes.

- xv. Cell phone or radio system use is not allowed at any time while the vehicle is in motion.
- xvi. Maintain three points of contact with the truck when mounting or dismounting it. (Contact should be made with one hand and two feet or two hands and one foot at all times.)

## **7. PEDESTRIAN BEHAVIOR AND VEHICLE INTERACTION**

The following pedestrian behaviors (or similar) should be part of each departments safety rules and training. They shall be enforced by supervision.

- a. Stop and look both ways before stepping into any area to which vehicles have access.
- b. Avoid distracting activities such as reading, using personal audio equipment (cell phone, iPod, etc.) while walking.
- c. Where available, walk only within designated pedestrian walkways. (inside and outside in the yards)
- d. Do not walk more than two abreast in any pedestrian walkway.
- e. STOP and LOOK when a powered industrial-truck operator is sounding the truck's service horn. Make eye contact with the operator and use "STOP" and "GO AHEAD" hand signals to communicate to the operator who will proceed first.
- f. Adhere to the "Arm's Length Rule" (2'/0.6m) from any powered industrial truck in operation.
- g. Wear high-visibility clothing (vest, coats) when required high vehicle traffic areas or restricted areas. (Yards, truck bays, maintenance shops ect.)
- h. Never enter aisle ways which are "blind spots" for vehicle operators.
- i. Never take short cuts through restricted areas.
- j. Always maintain "eyes on path" while being conscious of peripheral movement.

## **8. LAYOUT AND CONDITIONS FOR SAFE VEHICLE OPERATION**

- a. Every workplace shall be organized in such a way that pedestrians and vehicles can circulate in a safe manner such that vehicles (or Pedestrians) may use a traffic route without causing danger to the safety of persons at work near it.
- b. Where vehicles and pedestrians use the same traffic route, there shall be sufficient separation between them (including through doors, gates etc)
- c. Vehicle and pedestrian routes shall be separated, marked, and posted with the appropriate signage.
- d. Appropriate speed limits should be set and clearly displayed on vehicle routes.
- e. Any traffic route which is used by both pedestrians and vehicles shall be wide enough to enable any vehicle likely to use the route to pass pedestrians safely.
- f. Where pedestrian and vehicle routes cross, appropriate crossing points shall be provided.

- g. Barriers or railings shall be installed at pedestrian access points to vehicle aisles (e.g., from stairways, offices, canteens, locker rooms, employee entrances, etc.). The purpose of the barriers is to prevent pedestrians entering vehicle aisles or zones until they have had a chance to check for vehicle hazards and as a refuge from moving vehicles.
- h. Where an enclosed pedestrian route (or a doorway or staircase etc) joins a vehicle route there should be an open space of at least one meter from which pedestrians can see along the vehicle route.
- i. One-way systems should be designated and enforced if needed to prevent vehicles passing in opposite directions encroaching on pedestrian areas, allow safe movement of vehicles with wide loads, around blind bends etc. and, eliminate reversing for vehicles with poor rear visibility.
- j. Roadways shall be kept in good condition without potholes or loose surfaces etc.

## **9. LOADING DOCK DESIGN, OPERATION, AND USE**

- a. Specification for new shipping docks shall comply with Automotive Industry Action Group guidelines in addition to all current local regulations. These requirements shall be achieved for all departments with loading dock systems.
  - i. Dock levelers – An adjustable, usually powered, hinged plate fixed to the building to provide a bridge. Must extend 12" beyond dock bumper. Absolute maximum slope for Fork Truck operation 10% with working maximum 7%.
  - ii. Dock bumpers – Laminated (not molded) minimum 10" wide x 20" vertical x 6" deep (including ½" steel plate).
  - iii. Trailer Restraints (dock locks) – To prevent trailer 'creep' and inadvertent 'pull away' by tractor driver. These are to be powered and include visual indication of status. In the absence of this equipment and until the compliance date, the use of two chocks of minimum height 8" for each trailer must be enforced.
  - iv. Safety gates – This may take the form of a 'lip barrier' integrated into the dock leveler design. Where this is not present, a robust powered gate or similar device at the dock door should be installed to prevent trucks (and pedestrians) from falling into an unoccupied truck well.
  - v. Dock lights – must provide sufficient illumination for safe working without dazzle or glare. Graduated light levels may be necessary to allow for operator's 'night vision' to adjust when driving between high and low lighting levels
- b. Trailer inspection protocol. This is the responsibility of all vehicle operators before driving onto a docked trailer and should be included in their training. Responsibilities include: ensuring that the trailer is safely restrained; the trailer is safely jacked (or attached to the tractor unit); the dock leveler is correctly



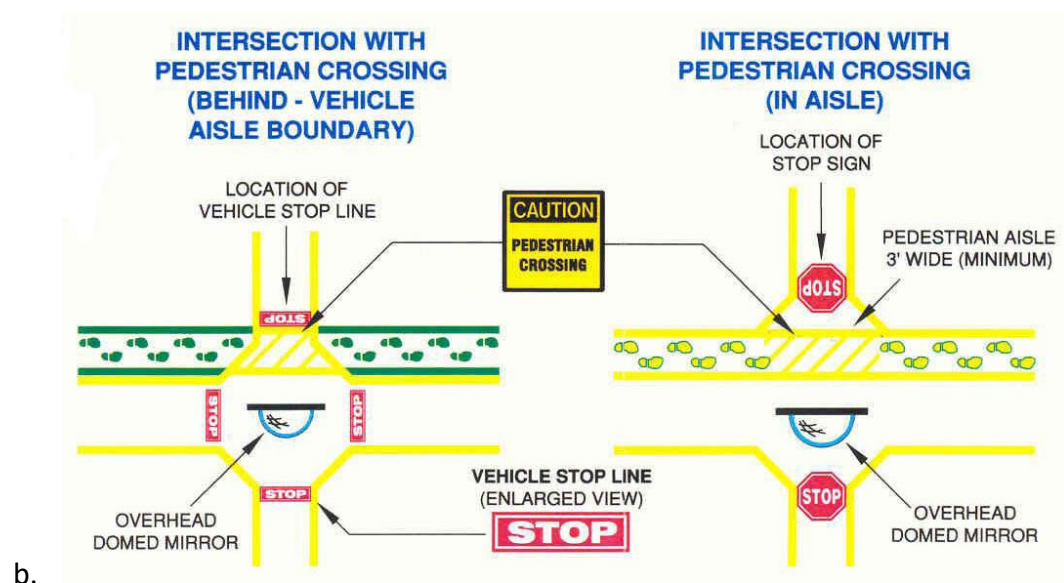
positioned; and, the trailer bed is sound without obvious damage and suitable for the intended load. Remember there are No Laws/Regulations on Trailers Conditions so checking their condition prior to entering is very important part of keeping employee's safe.

## 10. RISK ASSESSMENT

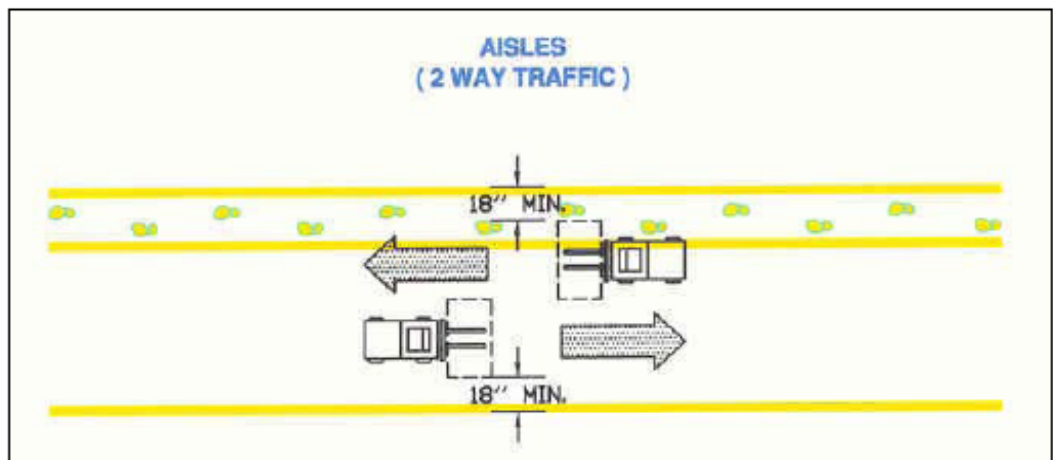
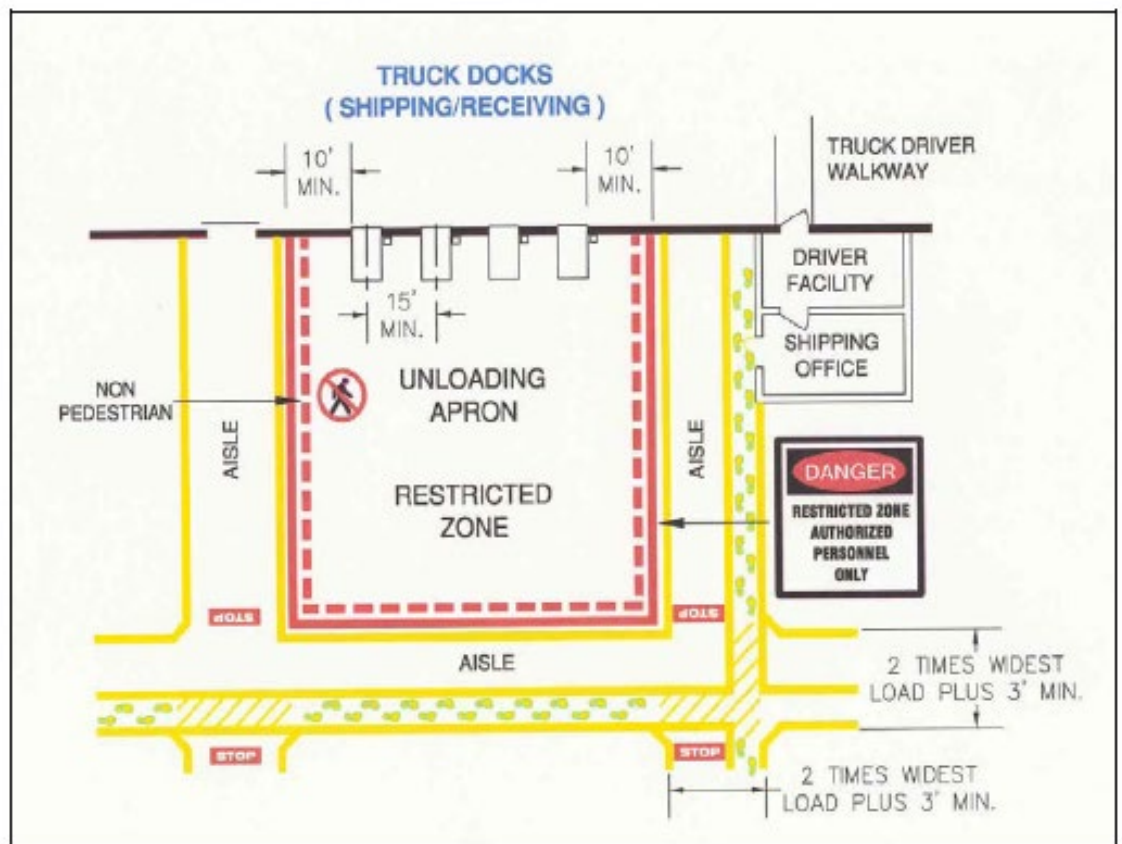
- a. Risk Assessment shall be completed to determine the hazards presented by industrial vehicles to operators and other personnel. Once the hazards have been identified and the risk assessed, the process shall be concluded by risk reduction, developing safe systems of work, procedures, separation of vehicles and pedestrians etc.
- b. The Risk Assessment shall include the material handling operations, the adequacy of the vehicle and the department layout (maintenance shops, yards, warehouses ect.) to ensure the safety of all personnel.

## 11. (Examples) TRAFFIC MANAGEMENT AND FLOOR MARKING GUIDELINES

- a. Restricted Zones - floor should be marked as below, with stripe widths of 4-inch minimum (100mm). Danger signs stating, "RESTRICTED ZONE - AUTHORIZED PERSONNEL ONLY" or "VEHICLE AISLE ONLY – PEDESTRIANS PROHIBITED" are to be posted along all boundaries of restricted zones. Examples of restricted zones include shipping docks, receiving docks, material storage areas, and pathways where minimum 18 inch clearances between loads and obstructions are not possible. As layouts change, restricted zones should be re-evaluated.



- c. Pedestrian Crosswalks should be marked as below and be provided with appropriate signage and mirrors for both pedestrian and vehicular traffic.
- d. Traffic and Pedestrian Separation Aisles



(NB 18" equivalent)

## 12. REFERENCES

- a. MIOSHA Part 21 Powered Industrial Trucks
- b. ANSI standards aspects of Pedestrian / Forklift Truck interaction
- c. U.S. OSHA Regulations: 29 CFR 1910.178 – Powered industrial trucks (as amended November 18, 2016)

## APPENDIX A

### RISK ASSESSMENT

*It is important to realize that on-site assessments are necessary in order to identify those areas requiring pedestrian/vehicular safety controls. However, safety controls themselves will not ensure that pedestrian risks are reduced. Effective implementation of the program should include specific training and verification - for both equipment operators and pedestrians. This should focus on proper interpretation and compliance with these controls.*

1. Powered industrial trucks and other powered vehicles should be separated from pedestrian traffic wherever possible and always following significant plant re-layout. In areas where this is not possible, added safety controls (physical and visual) are required to reduce pedestrian risks.
2. Each assessment should be documented and should identify problem areas as well as required improvement modifications. Analysis of traffic flow patterns and the design elements outlined below is essential.

#### Design Considerations

- a) Aisle widths and color-coded demarcation lines
- b) Personnel access doorway locations
- c) Material storage locations (e.g., material warehouse, line-side storage, etc.)
- d) Floor, office locations including personnel access doorways
- e) Employee service locations (e.g., shop floor entrances, break rooms, cafeterias, canteens, locker rooms, entrances for employees and non-employees, emergency exits, medical, parking lot entrances, restrooms, secured accesses for employees and non-employees, etc.)
- f) Shipping and receiving dock locations (e.g., loading bays, personnel access doorways, shipping offices, etc.)
- g) Stairwell locations
- h) Drinking fountain locations etc

#### Powered Industrial-Truck Traffic Flow considerations

- a) Load configurations and variation.
- b) Travel speeds laden and unloaded.
- c) Fork height while in transit.
- d) Dolly configuration and trailing features.
- e) Observation and enforcement of powered industrial-truck operating rules and regulations.
- f) Ancillary device use (e.g., reverse light, warning lights, automatic audible alarms, service horn, truck-mounted mirrors, etc.).
- g) One-way versus two-way aisle traffic.
- h) Areas where pedestrians and vehicles regularly use the same space (e.g. parts delivery to and from production machines, doorways, cross walks, etc)

Pedestrian Traffic Flow considerations including

- a) Main and secondary entrances and exits
- b) Cafeterias, canteens, break rooms.
- c) Administration facilities and offices connected to maintenance areas
- d) Visitors (e.g., all types of contractors, vendors, service people, etc.)
- e) Receiving and shipping docks
- f) Known trouble spots (congested areas, blind corners, near miss incidents etc)

## **APPENDIX B**

### **OBSERVING THE BEHAVIOR OF INDUSTRIAL POWERED VEHICLE DRIVERS AND PEDESTRIANS**

Observing driver behavior can be problematic because Industrial vehicles are mobile. Suggestions to overcome this include:

- a) Train a vehicle operator as an observer (so that they are also mobile)
- b) Observe vehicle operator if they enter the 'window of observation' during a 'normal' observation.
- c) Separate observation into three elements: Introduction before shift (say where and when observation will happen); observe where and when specified; and, feedback and discussion at a convenient time afterwards (such as shift change, etc)
- d) Combination of all the above
- e) Involve one or more drivers in developing appropriate behaviors (e.g. the rule might be a maximum driving speed 6-8 miles per hour but the observable behavior is not to drive faster than a brisk walking pace)
- f) Give all drivers the opportunity to critique and contribute to the behavior definitions
- g) Strategies should be developed to observe and record behaviors relating to pedestrian and driver interaction (the pedestrian behaviors with the greatest relevance are listed in Section 7 – Pedestrian Behaviors.