

# **Materials Handling, Storage, Use, and Disposal**

## **10-Hour Construction Outreach**

# Materials Handling, Storage, Use, and Disposal

- Lesson Overview
  - Types of material handling equipment.
  - Hazards associated with material handling activities
  - Prevention of hazards associated with material handling equipment
  - Employer requirements to protect workers from material handling hazards

# Types of Equipment

## Conveyors



Source: OSHA

## Powered Industrial Trucks



Source: TEEX-Harwood

# Types of Equipment

## Cranes



Source: OSHA

## Slings



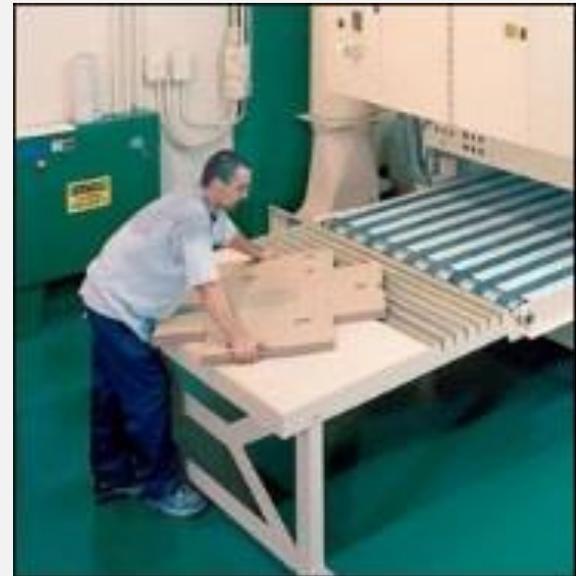
Source: OSHA

# Factors Contributing to Injuries

- Weight and bulkiness of objects
- Bending, twisting, turning movements



Source: OSHA



Source: OSHA

# Hazards

- Improper operation of equipment
- Accumulated materials or clutter



Source of photos: OSHA

# Hazards

- Unsafe conditions of materials or containers
- Flammability or toxicity of some materials



Source: OSHA

# Hazards

- Weight of materials
- Binding ties or other devices that secure bundles or bound materials



Source: OSHA



Source: OSHA

# Hazards

- Falling objects
- Lifting, pushing, pulling, or otherwise manually moving large, heavy items



Source: OSHA



Source: OSHA

# Hazards

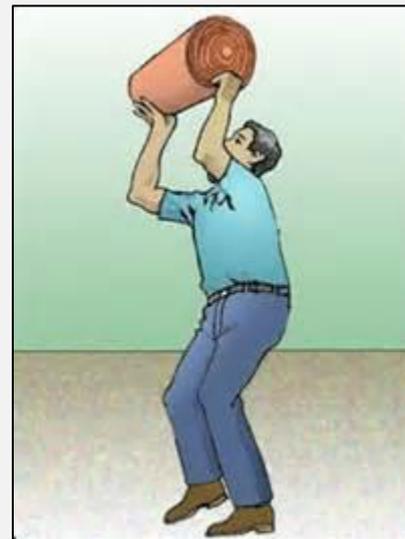
- Improperly stacked materials
- Struck-by or caught-in/-between hazards



Source of photos: TEEX - Harwood

# Injuries

- Types of injuries commonly reported
  - Sprains, strains, tears
  - Soreness and pain
  - Bruises and contusions
  - Cuts, lacerations, and punctures



Source: OSHA

# Injuries

- Examples of events or exposures leading to injuries
  - Contact with objects and equipment
  - Transportation incidents
  - Exposure to harmful substances or environments



Source: OSHA



Source: OSHA

# Injuries

- Falls, slips, trips, or loss of balance
- Repetitive motion
- Overexertion



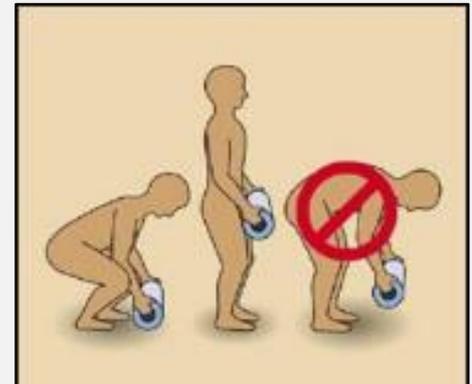
Source: OSHA



Source: OSHA

# Preventing Hazards

- Moving materials manually
  - Use devices to assist with holding loads
  - Wear PPE
  - Use proper lifting technique
  - Seek help for oversized loads
  - Use blocking materials



Source of photos: OSHA

# Preventing Hazards

- Cranes
  - Major types of crane accidents
    - Contact with power lines
    - Overturns
    - Falls
    - Mechanical failure



Source: OSHA

# Preventing Hazards

- Hoisting tons of material, steel, and concrete with cranes
- Operated only by thoroughly trained and competent workers



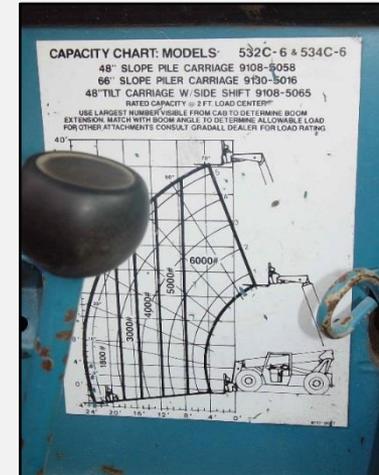
Source: OSHA



Source: TEEX - Harwood

# Preventing Hazards

- Eliminate/reduce crane hazards by:
  - Knowing
    - Load
    - Capacity of the crane
    - When the load is safe to lift
  - Always checking crane load chart and never exceed load limits



Source: TEEX - Harwood



# Preventing Hazards

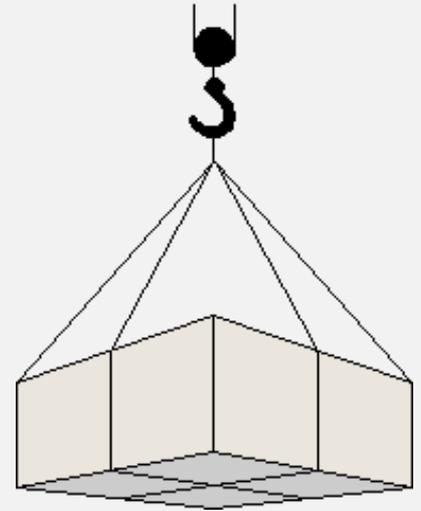
- Inspection of crane by a qualified person
  - Modified, repaired, or adjusted
  - Post-assembly
  - At least every 12 months
  - Equipment not in regular use
- Visual inspection by a competent person
  - Prior to each shift
  - Monthly



Source: OSHA

# Preventing Hazards

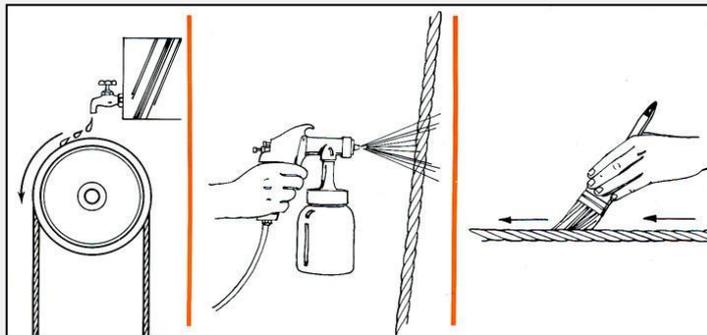
- Slings
  - Connect a crane hook to a load
  - Proper selection
  - Inspection



Source of photos: OSHA

# Preventing Hazards

- Reduce sling hazards by:
  - Lubricated
  - Do not shorten with knots, bolts, or other devices, or kink legs
  - Keep clear of loads
  - Avoid sudden movement



Source: OSHA



Source: OSHA

# Preventing Hazards

- Forklifts
  - Main causes of injuries
    - Forklift overturns
    - Forklift striking workers on foot
    - Persons crushed by forklifts
    - Persons falling from forklifts



Source: OSHA

# Preventing Hazards

- Illegal forklift operators
  - Anyone under 18
  - Anyone not properly trained and certified



Source of photos: OSHA

# Preventing Hazards



- Driving the forklift
  - Obstructed vision
  - Travel path
  - Approaching people
  - Elevated platform
  - Seat belts and ROPS
  - Raising/lowering forks
  - Safe distance



Source of photos: OSHA

# Preventing Hazards

- Elevating workers with forklift
  - Standing on forks
  - Lifting personnel
  - Approved lift platform
  - Restraining means



Source: OSHA

# Preventing Hazards

## – Driving forklift on Grades/Ramps

- Use extreme caution
- No turns
- Tilting and raising load
- Point load up the incline



Source of photos: OSHA



# Preventing Hazards

- Forklift operating speed
  - Tip-overs
  - Turning
  - Avoiding collisions
  - Wet and slippery floors
  - Ascending/descending
  - Obstructed vision

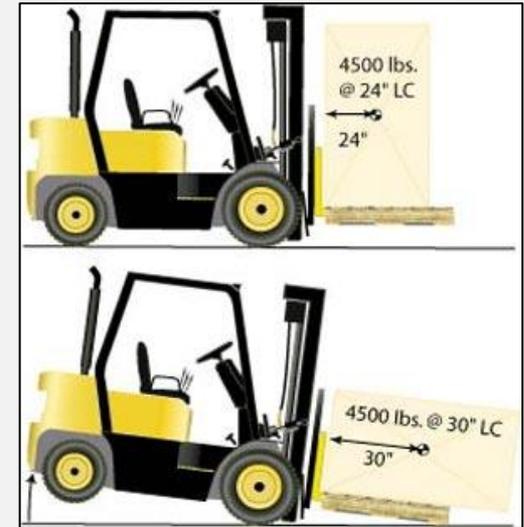


Source of photos: OSHA

# Preventing Hazards

## – Avoiding Excess Weight

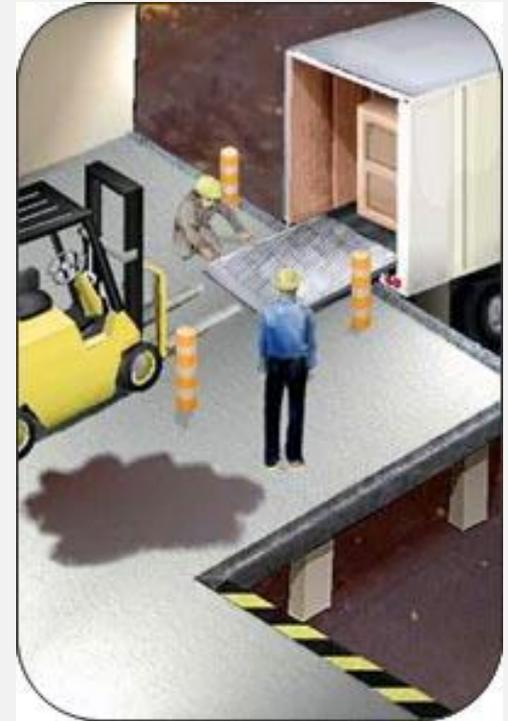
- Do not exceed weight capacity of forklift.
- Center loads and secure to keep from shifting to maintain balance of weight



Source: OSHA

# Preventing Hazards

- Use of Dock Boards for Loading/Unloading
  - Bridging space
  - Securing portable dock boards
  - Handholds for dock boards



Source: OSHA

# Preventing Hazards

- Exiting the Forklift
  - Set brake, lower forks/lifting carriage, neutralize controls
  - Stand-up type forklift
- Riding the forklift
  - No passengers allowed
  - Exception – seat is provided

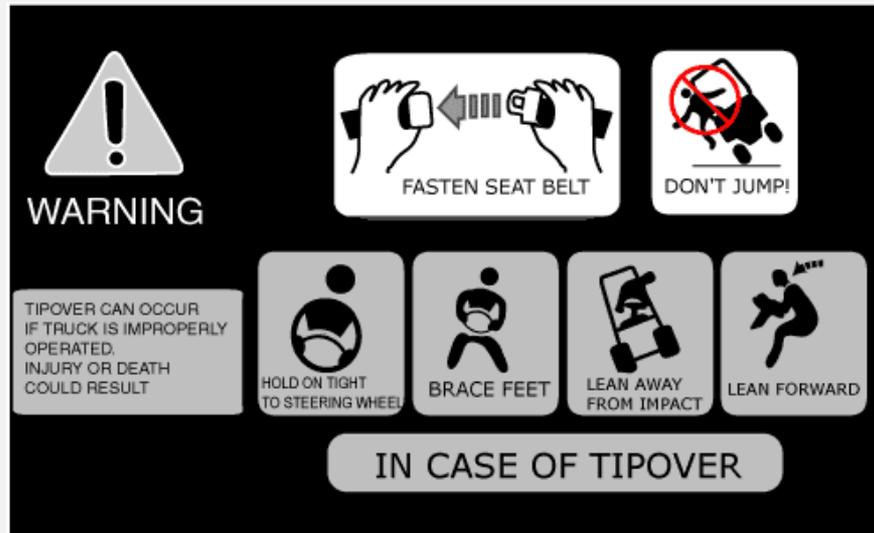


Source of photos: OSHA

# Preventing Hazards

## – Avoiding Struck-by/Crushed-by

- Don't jump from an overturning, sit-down type forklift.
- Stay with the truck, hold on firmly, and lean in the opposite direction of the overturn.



Source: OSHA

# Preventing Hazards

- Forklift Training – do not operate a forklift without proper training and licensing.
- Reporting Damage – any damage or problems that occur to a forklift during a shift should be reported to the supervisor.



Source: OSHA

# Preventing Hazards

- Earth-Moving Equipment
  - Scrapers
  - Loaders
  - Crawlers
  - Bulldozers
  - Off-highway trucks
  - Graders
  - Tractors



Source of photos: TEEX - Harwood

# Preventing Hazards

- Earth-Moving Equipment
  - Seatbelts
  - Reverse gear not used unless that piece of equipment has:
    - Back-up signal alarm or
    - Signaler
  - Operator properly trained



Source: OSHA

# Employer Requirements

- Comply with OSHA standards related to materials handling, including:
  - Training requirements, including requirements for forklift training.
  - Inspection requirements



Source of photos: OSHA



# Employer Requirements

- Comply with manufacturers' requirements and recommendations for materials handling equipment.



Source : OSHA

# Recognizing Hazards

Identify potential hazards and possible solutions:



Source of photos : OSHA

# Recognizing Hazards

Identify potential hazards and possible solutions:



Source: OSHA



Source: TEEX - Harwood

# Recognizing Hazards

Identify potential hazards and possible solutions:



Source of photos : TEEX Harwood

# Knowledge Check

1. How old do you have to be to operate a forklift, regardless of training?

- a. 16
- b. 18
- c. 21
- d. 25

**b. You must be at least 18 years old to operate a forklift.**

# Knowledge Check

2. One good way to prevent materials handling hazards is to \_\_\_\_.
- a. refuse to allow personnel to ride equipment without a seat and seatbelt
  - b. report all damaged equipment immediately
  - c. operate within manufacturer's specifications
  - d. All of these.

**d. All of these are good ways to prevent materials handling hazards.**

# Knowledge Check

3. Which of the following is a method for eliminating or reducing crane operation hazards?
- a. Operators should know how much they are lifting as well as the rated capacity of the crane.
  - b. A competent person should visually inspect the crane once a year.
  - c. Never exceed the load limit by more than 10%.
  - d. All of these.

**a. Crane operators should know how much they are lifting and the rated capacity of the crane.**

# Knowledge Check

4. Employers must comply with OSHA standards related to materials handling, including training and \_\_\_\_\_.
- a. equipment
  - b. operations
  - c. inspection
  - d. All of these.

**c. Employers must comply with OSHA standards for training and inspection.**