Materials Handling, Storage, Use, and Disposal

Overview -- Handling and Storing Materials

- Involves diverse operations:

- Manual material handling
  - **Carrying bags or materials**
  - **Unpacking materials**
- Material handling via machine
  - **Forklift**
  - **Crane**
  - **Rigging**
- Stacking or storing drums, barrels, kegs, lumber, loose bricks or other materials

Injuries

Lifting objects is a major cause of back injuries in the work place

Improper storing and handling of material and equipment can cause struck by and crushed by injuries

Hazards

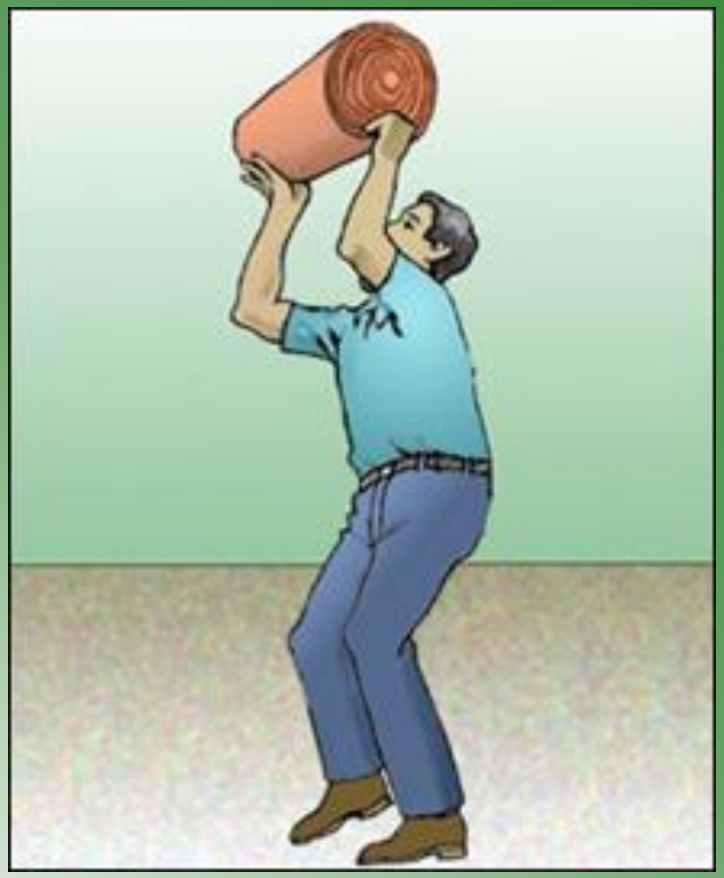
- Improper manual lifting or carrying loads that are too large or heavy
- Being struck by materials or being caught in pinch points
- Crushed by machines, falling materials or improperly stored materials
- Incorrectly cutting ties or securing devices

Manual Handling

- Seek help:
  - When a load is too bulky to properly grasp or lift
  - When you can't see around or over the load
  - When you can't safely handle the load

- Attach handles to loads to reduce the chances of getting fingers smashed.

Safe Lifting



- Break load into parts
- Get help with heavy or bulky items
- Lift with legs, keep back straight, do not twist
- Use handling aids – such as steps, trestles, shoulder pads, handles, and wheels
- Avoid lifting above shoulder level

Safe Lifting Training

- What should be taught:
- How to lift safely
- How to avoid unnecessary physical stress and strain
- What you can comfortably handle without undue strain
- Proper use of equipment
- Recognizing potential hazards and how to prevent / correct them

Personal Protective Equipment

- For loads with sharp or rough
- edges, wear gloves or other
- hand and forearm protection

- When loads are heavy or bulky,
- wear steel-toed safety shoes to
- prevent foot injuries if the load
- is dropped

Materials Handling Equipment

- Employees must be trained in the proper use and limitations of the equipment they operate

- This includes knowing how to effectively use equipment such as forklifts, cranes, and slings

Forklifts

- Center the load on the forks and as close to the mast as possible to minimize the potential for the truck tipping or load falling

- Overloading a lift truck makes it hard to control and could make it tip over
- Place the load at the lowest position for traveling
- Don't place extra weight on the rear of a counterbalanced forklift to allow an overload

Operating a Forklift Safely

- Keep arms and legs inside the truck
- Handle only stable loads
- Keep speed low – you may have to stop
- Be careful when making sharp turns
- with a raised load

Operating a Forklift Safely

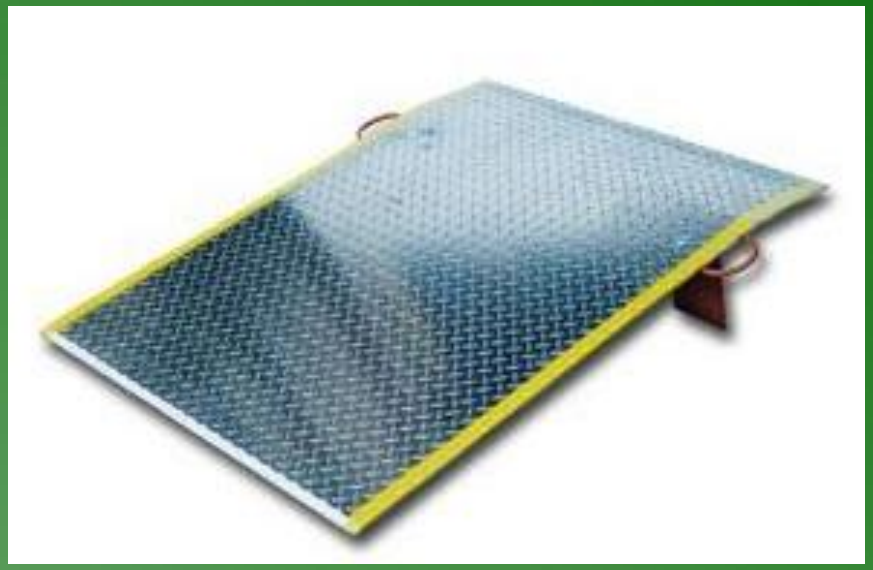
- If a load blocks your view, travel in reverse
- No riders, unless there's an approved seat
- Don't drive with forks raised
- Wear safety belts or other restraint devices

Powered Industrial Truck Training

- Truck-related topics
- Workplace-related topics
- Standard requirements
- Trainees must be supervised by a competent person and not endanger others
- Formal instruction
- Practical training
- Evaluation of performance

Dock Boards (Bridge plates)

- Dock boards must
- have handholds, or
- other effective means
- for safe handling.



Earthmoving Equipment

- Scrapers, loaders, crawler or wheel tractors, bulldozers, off-highway trucks, graders, tractors
- Provide seat belts
- Equipment with an obstructed rear view can't be used in reverse unless the equipment has a signal alarm

Cranes

- Check the load chart in the cab
- Frequently inspect
- Never lift people
- Check overhead power lines
- Ensure area of travel is clear

Rigging Equipment Slings

Types of slings covered are those made from alloy steel chain, wire rope, metal mesh, natural or synthetic fiber rope, and synthetic web.

Chain

Wire rope

Metal mesh

Synthetic

Sling Inspection

Inspect slings:

- **Each day before use**
- **Where service conditions warrant**

Remove them from service if damaged or defective

Remove From Service

Immediately remove damaged or defective slings from service

Alloy Steel Chains

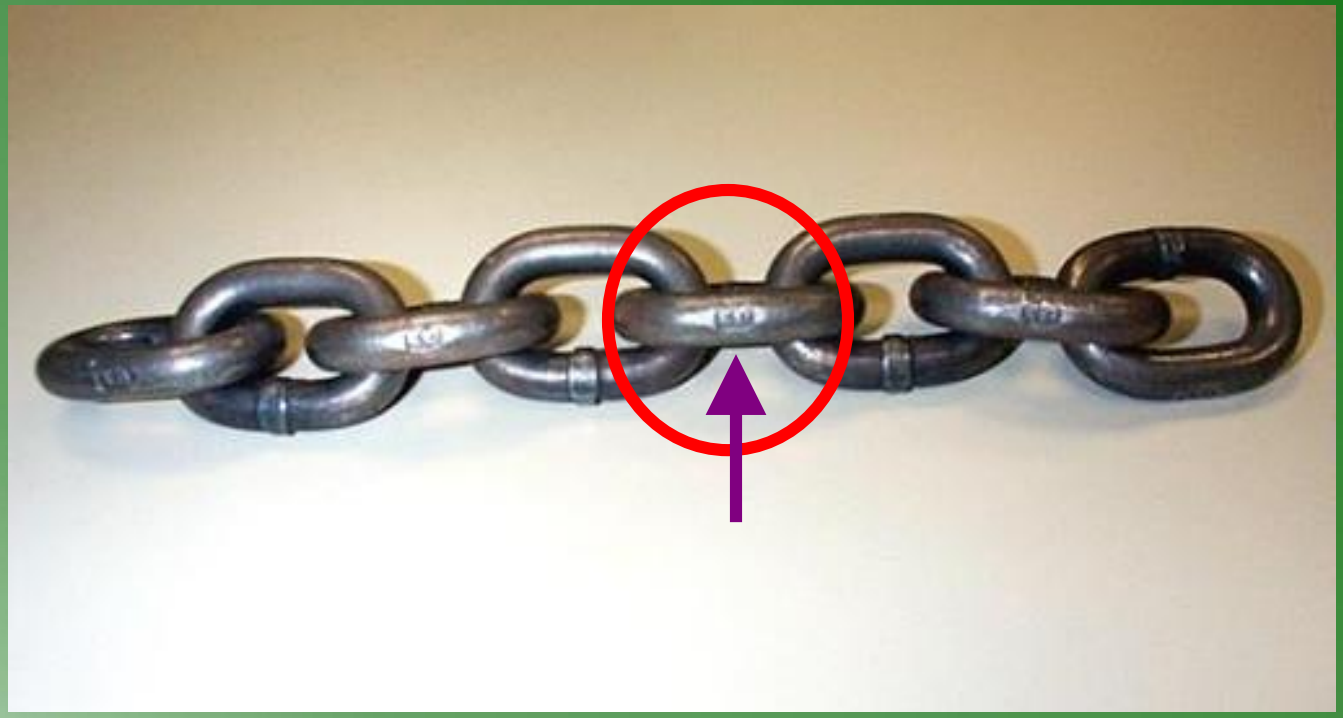
Adapts to shape of the load

Can damage by sudden shocks

Best choice for hoisting very hot materials

Must have an affixed tag stating size, grade, rated capacity, and sling manufacturer

Markings
Alloy Steel Chain



It must be marked with grade or manufacturer's mark

Alloy Steel Chain Attachments

Rated Capacity

Hooks, rings, oblong links, or other attachments, when used with alloy steel chains, must have a rated capacity at least equal to that of the chain

Unsuitable Alloy Steel Chain Attachments

Right

Wrong

Job or shop hooks and links, or makeshift fasteners, formed from bolts, rods, etc., or other such attachments, can't be used

Chain Wear

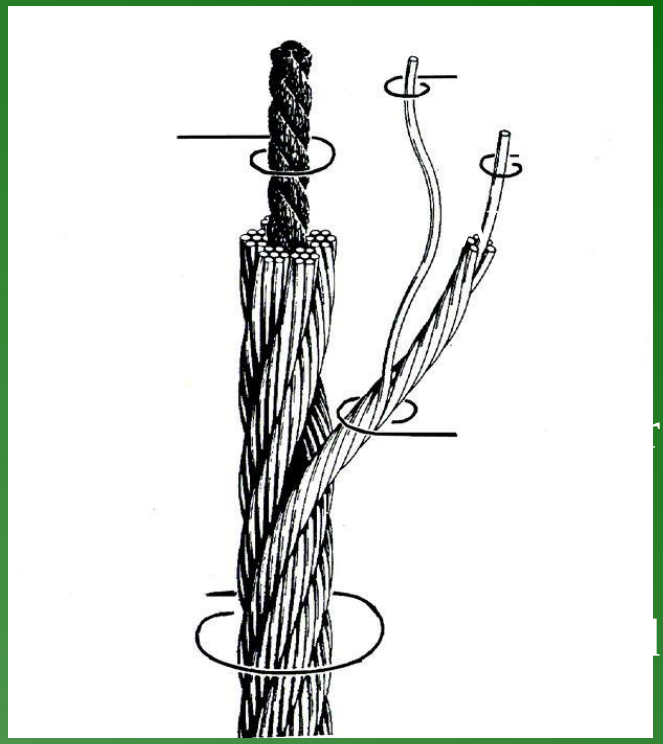
When a chain shows excessive wear, or is cracked or pitted, remove it from service

Non-alloy repair links can not be used

Wire Rope Slings

- Used to hoist materials

- Selection considerations:
  - strength
  - ability to bend without cracking
  - ability to withstand abrasive wear
  - ability to withstand abuse



Wire rope

Wire Rope Slings
Eye Splices

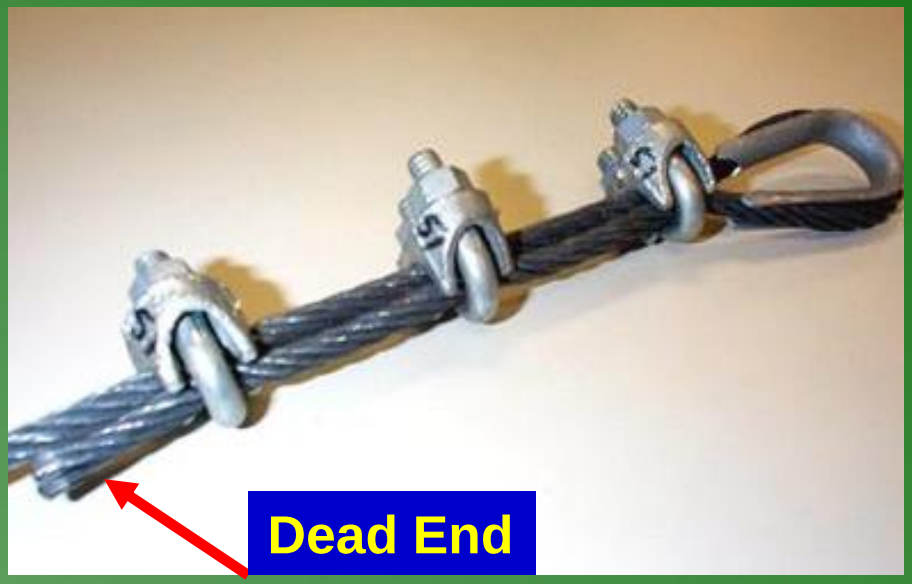
- Eye splices made in any wire rope
- must have at least three full tucks

Protruding Ends

Cover or blunt protruding ends of strands

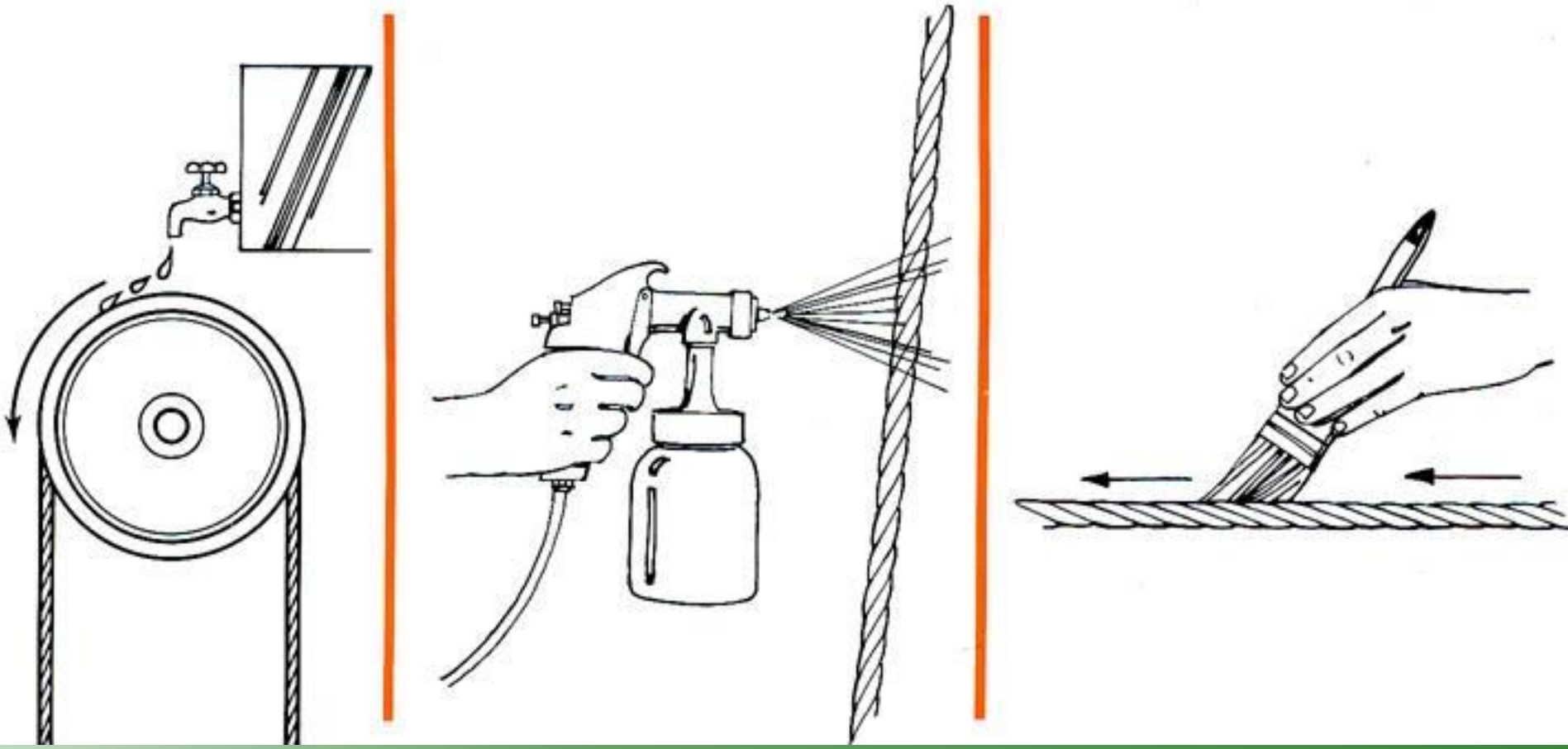
Wire Rope Clips

When using U-bolt wire rope clips to form eyes, ensure the "U" section is in contact with the dead end of the rope



This is the correct method

Lubrication



Regularly lubricate ropes and chains

Wire Rope Slings
Remove From Service

If these happen, remove the wire rope sling from service

Bird Caging

Kinking

Crushing

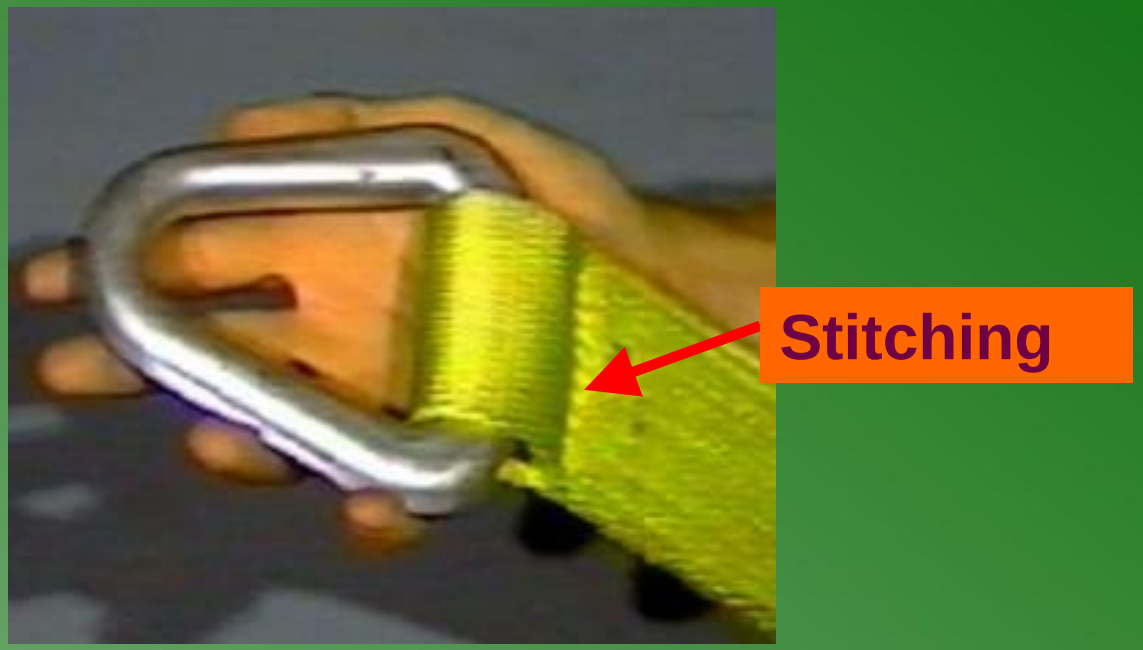
Synthetic Web Sling
Markings

- Mark or code to show:
  - **Name or trademark of manufacturer**
  - **Rated capacities for the type of hitch**
  - **Type of material**

Synthetic Web Slings
Fittings

- Fittings must be:
  - **At least as strong as that of the sling**
  - **Free of sharp edges that could damage the webbing**

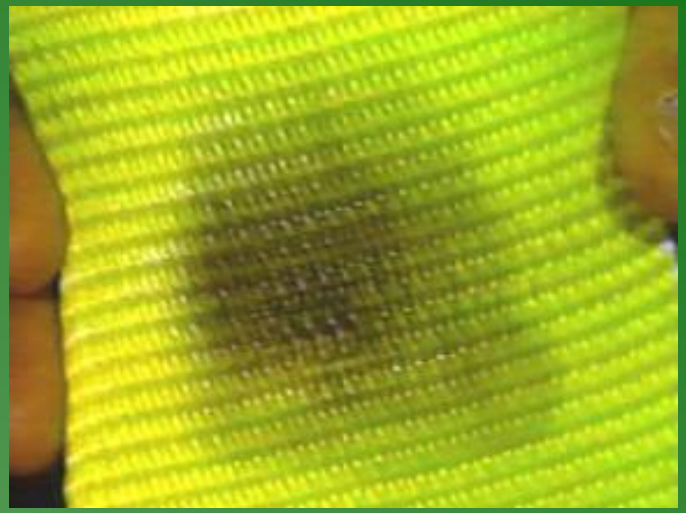
Synthetic Web Sling
Stitching



- Stitching is the only method allowed to attach end fittings to webbing, or to form eyes

Synthetic Web Slings -
Remove from Service

- Remove from service if any of these are present:
  - **Acid or caustic burns**
  - **Melting or charring of any part**
  - **Snags, punctures, tears or cuts**
  - **Broken or worn stitches**
  - **Distortion of fittings**



Heat Damage

Storing Materials

Secure materials stored in tiers by stacking, racking, blocking, or interlocking to prevent them from falling

Post safe load limits of floors

Keep aisles and passageways clear

Storing Materials

- Don't store noncompatible materials together
- In buildings under construction, don't place stored materials within 6 feet of a hoistway or floor opening

Fall Protection

Employees who work on stored materials in silos, hoppers, or tanks, must be equipped with lifelines and harnesses

Brick Storage

- Stack bricks in a manner that will keep them from falling
- Do not stack them more than 7 feet high
- Taper back a loose brick stack after it is 4 feet high

Lumber

- Remove nails before stacking
- Stack on sills
- Stack lumber so that it is stable and self supporting

Housekeeping

Keep storage areas free from accumulated materials that cause tripping, fires, or explosions, or that may contribute to harboring rats and pests

Disposal of Waste Materials

- Use an enclosed chute when you drop material more than 20 feet outside of a building

- If you drop debris through holes in the floor without chutes, enclose the drop area with barricades

Disposal of Scrap and Flammable Materials

immediate work area as work progresses

Keep all solvent waste, oily rags, and flammable liquids in fire resistant covered containers until removed from worksite
Remove all scrap lumber, waste material, and rubbish from the

Disposal of Demolition Materials

Removal of materials through floor openings

- Openings must be less than 25 percent of the whole floor
- Floors weakened or made unsafe by demolition must be shored so they can safely carry the demolition load

Summary

- Manually handling materials
  - **When lifting objects, lift with your legs, keep your back straight, do not twist, and use handling aids**
- Using cranes, forklifts, and slings to move materials
  - **Watch for potential struck by and crushed by dangers**
  - **For slings, check their load capacity, inspect them, and remove them from service when they display signs of stress or wear**
- Also –
  - **Keep work areas free from debris and materials**
  - **Store materials safely to avoid struck by/crushed by hazards**