Materials Handling, Storage, Use and Disposal

- 29 CFR 1926 – Subpart H
Objectives

In this course, we will discuss:

- Minimum OSHA requirements for material handling, storage and equipment
- Cover safe storage of materials
- Review proper use of rigging equipment
- Identify hazards and abatement methods
Materials Storage

- In buildings under construction, materials must not be placed within 6 feet of a hoistway or floor opening.

1926.250(b)(1)
Use personal fall arrest equipment when working on stored material in silos, hoppers, tanks, and similar storage areas.

Noncompatible materials shall be segregated in storage.

Materials shall not be stored on scaffolds or runways except for immediate operations.
Materials Storage

- Stack bricks in a manner that will keep them from falling.
- Do not stack more than 7 feet high.
- Taper back a loose brick stack after it is 4 feet high.
Materials Storage 1926.250(b)(7)

- When masonry blocks are stacked higher than 6 feet
  - The stack should be tapered back one-half block per tier above the 6-foot level.
Materials Storage

Storage of lumber

- Remove nails before stacking
- Stacked level and on sills
- Stack lumber so that it is stable and self supporting
- Piles not to exceed 20 feet
  » 16 feet if handled manually
Materials Storage

- Structural steel, pipe, bar stock, etc., unless racked, must be stacked and blocked to prevent spreading or tilting.
● Storage areas must be kept free from accumulation of materials that create hazards from:
  – Tripping
  – Fire
  – Explosion
  – Pest harborage
Dockboards must be strong enough to carry imposed load.

- Portable dockboards must be properly secured in position.
- Provided with handholds, or other effective means, to permit safe handling.
Dockboards

Positive protection must be provided to prevent railroad cars from moving during loading or unloading operations.
Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe.

Defective rigging equipment shall be removed from service.
Rigging Equipment  

- Most commonly used sling configurations in construction rigging
  - Vertical, choker, and basket hitches

- Use applicable tables in Subpart H for rated capacities of various sling configurations
### General

- Rigging equipment shall not be loaded in excess of its recommended safe working load.

| TABLE H - 1. -- RATED CAPACITY (WORKING LOAD LIMIT), FOR ALLOY STEEL CHAIN SLINGS (1) |
|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| Chain size, inches                              | Single branch                                   | Double sling vertical angle                     | (1)                                              | (1)                                              | (1)                                              |
|                                                | loading                                        | 90 deg.                                         | 30 deg.                                         | 45 deg.                                         | 60 deg.                                         |
| 1/4.....                                       | 3,250                                          | 5,560                                           | 4,550                                           | 3,250                                           |                                                  |
| 3/8.....                                       | 6,600                                           | 11,400                                          | 9,300                                           | 6,600                                           |                                                  |
| 1/2.....                                       | 11,250                                          | 19,500                                          | 15,900                                          | 11,250                                          |                                                  |
| 5/8.....                                       | 16,500                                          | 28,500                                          | 23,300                                          | 16,500                                          |                                                  |
| 3/4.....                                       | 23,000                                          | 39,800                                          | 32,500                                          | 23,000                                          |                                                  |
| 7/8.....                                       | 28,750                                          | 49,800                                          | 40,600                                          | 28,750                                          |                                                  |
| 1.....                                         | 38,750                                          | 67,100                                          | 54,800                                          | 38,750                                          |                                                  |
| 1 1/8...                                      | 44,500                                          | 77,000                                          | 63,000                                          | 44,500                                          |                                                  |
| 1 1/4...                                      | 57,500                                          | 99,500                                          | 81,000                                          | 57,500                                          |                                                  |
| 1 3/8...                                      | 67,000                                          | 116,000                                         | 94,000                                          | 67,000                                          |                                                  |
| 1 1/2...                                      | 80,000                                          | 138,000                                         | 112,900                                         | 80,000                                          |                                                  |
| 1 3/4...                                      | 100,000                                         | 172,000                                         | 140,000                                         | 100,000                                         |                                                  |
Rigging equipment shall be removed from work area so as not to present a hazard to employees when not in use.

Custom design grabs, hooks, clamps, or other lifting accessories shall be marked to indicate the safe working loads.
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.
Rigging Equipment Inspections

Inspections

- Equipment must be inspected prior to use and each shift.
  » Also, as necessary during its use
- Damaged or defective equipment must be removed from service.
Alloy Steel Chains

- Chain slings must have permanently affixed durable identification stating:
  - Size, grade, rated capacity, and sling manufacturer

1926.251(b)(1)
Alloy Steel Chains

1926.251(b)(2)

- 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.
Job or shop hooks and links, or makeshift fasteners, formed from bolts, rods, etc., or other such attachments, shall not be used.

- Kinked or knotted chains must not be used for lifting.
- Chains must not be shortened by bolting, wiring or knotting.
Alloy Steel Chains

- Must adhere to manufacturer’s recommended ratings for safe working loads of chains and chain slings
- Rated capacity must conform to values shown in Table H-1
Alloy Steel Chains

Chains must be removed from service when maximum allowable wear is reached at any point of any link.
  - As indicated in Table H-2
Alloy Steel Chains

A thorough periodic inspection of slings must be made on a regular basis.
- At least annually

Inspection determined on the basis of:
- Frequency of sling use
- Severity of service conditions
- Nature of lifts being made
- Experience gained on service life of slings
Alloy Steel Chains

- A record of the most recent month in which the chain sling was thoroughly inspected must be maintained.

- The record must be available for examination.
Wire Rope Slings

Considerations when selecting wire rope

- Strength
- Flexibility or resistance to bending fatigue
- Resistance to abrasion
- Resistance to crushing
- Resistance to rotation
- Resistance to corrosion
Wire Rope Slings

- Eye splices made in any wire rope must have at least three full tucks.
Wire Rope Slings

Wire rope must not be used if in any length of eight diameters:

- Total number of visible broken wires exceed 10% of the total number of wires
- Rope shows excessive wear, corrosion, or defect
Wire Rope Slings

Bird Caging

Crushing

Kinking

Heat Damage
Wire Rope Slings

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

Correct Method
Synthetic Web Slings

- Synthetic web sling markings
  - Slings must be marked or coded to show:
    - Name or trademark of manufacturer
    - Rated capacities for the type of hitch
    - Type of material
Synthetic Web Slings

- Synthetic web sling markings
  - Fittings must have a breaking strength at least equal to that of the sling
  - Fittings must be free of sharp edges

1926.251(e)(4)
Synthetic Web Slings

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

1926.251(e)(5)
Environmental Conditions 1926.251(e)(6)-(7)

- **Chemicals**
  - Nylon web slings shall not be used where fumes, vapors, sprays, mists or liquids of acids or phenolics are present.
  - Polyester or polypropylene web slings, or web slings with aluminum fittings shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present.

- **Heat**
  - Synthetic web slings of polyester and nylon shall not be used in excess of 180 deg. F (82 deg. C).
  - Polypropylene web slings shall not be used at temperatures in excess of 200 deg. F (93.33 deg. C).
Synthetic Web Slings

- Remove from service if any of the following conditions 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
Shackles and Hooks

- Table H-19 shall be used to determine the safe working loads of various sizes of shackles.

- Higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products, provided that a safety factor of not less than 5 is maintained.

- Manufacturer’s recommended safe working loads not to be exceeded.
Shackles and Hooks

Follow manufacturer’s recommendations in determining safe working load (SWL)

- If manufacturer’s SWL is not available:
  » Must be tested to the intended SWL before they are initially put into use
  » Employer must keep a record of the dates and test results
Disposal of Waste Materials

- An enclosed chute must be used when dropping material more than 20 feet outside of a building.

1926.252(a)
Disposal of Waste Materials 1926.252(b)

- When debris is dropped through holes in floors without the use of chutes:
  - Area must be enclosed with barricades
  - Warning signs must be posted at each level
Disposal of Waste Materials 1926.252(c)-(e)

- All scrap lumber, waste material, and rubbish must be removed from the immediate work area as work progresses.

- Disposal of waste material or debris by burning shall comply with local fire regulations.

- All solvent waste, oily rags, and flammable liquids must be kept in fire resistant covered containers until removed from worksite.
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