

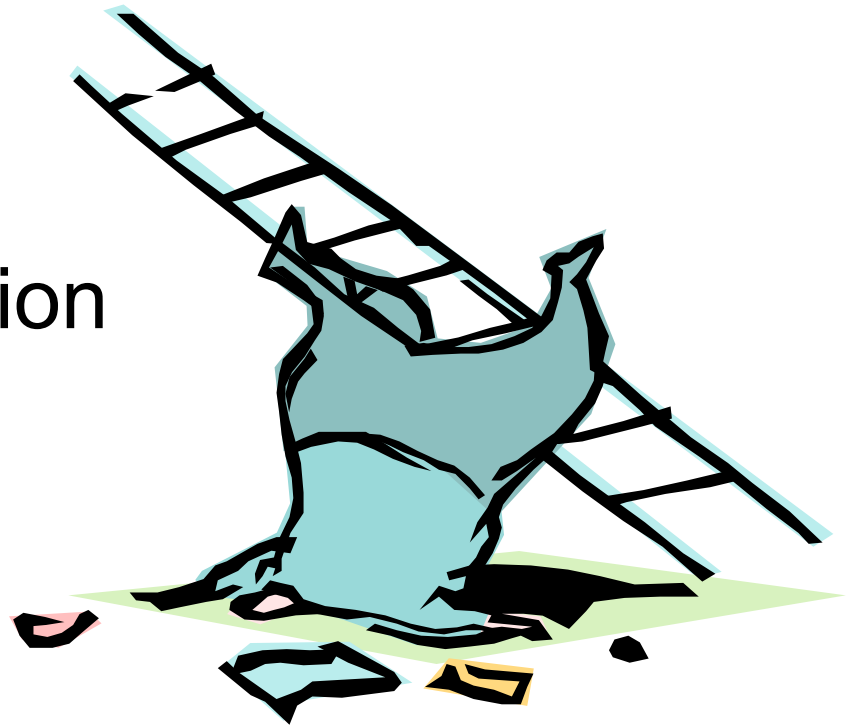
AVOID SLIPS, TRIPS AND FALLS



A LITTLE PREVENTION CAN SAVE A LIFETIME OF PAIN

Objectives

- Costs of slips, trips & falls (STFs)
- Definitions
- Causes of STFs
- Risk factors
- Prevention/minimization



Costs of STFs

- To the employee:
 - Lost wages & out-of-pocket expenses
 - Pain
 - Temporary or permanent disability
 - Reduced quality of life
 - Depression
 - Death

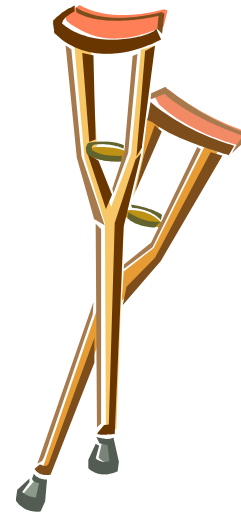


Frequency of STFs

- Slips, trips & falls make up majority of general industry accidents (USDOL)
 - 15% of all accidental deaths; 2nd leading cause behind motor vehicles
 - ~12,000/year
 - One of most frequently-reported injuries
 - ~25% of reported claims/year
 - Over 17% of all disabling occupational injuries result from falls
- Most could have been prevented

STF Injuries

- Sprains & strains
- Bruises & contusions
- Fractures
- Abrasions & lacerations



Typical Injury Sites

- Knee, ankle and/or foot
- Wrist &/or elbow
- Back &/or shoulder
- Hip
- Head



Definitions

- **Slip**
 - Too little friction or traction between feet (footwear) & walking/working surface, resulting in loss of balance



Definitions

- **Trip**
 - Foot or lower leg hits object & upper body continues moving, resulting in loss of balance
 - Stepping down to lower surface & losing balance

Potential Trip Hazards?



Definitions

- **Fall**

Occurs when one is too far off center of balance

Definitions (Falls, cont.)

- Two types of Falls

1. Fall at same level

Fall to same walking or working surface, or fall into or against objects above same surface



2. Fall to lower level

Fall to level below walking or working surface



Causes of Slips

- Wet product or spills on smooth floors or walking surfaces
 - Water
 - Mud
 - Grease
 - Oil
 - Food
 - Blood
 - Offal



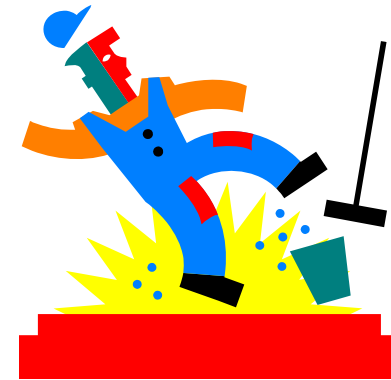
Causes of Slips

- Dry product or spills making walking surface slippery
 - Dusts
 - Powders
 - Granules
 - Wood
 - Food
 - Plastic wrapping



Causes of Slips

- Highly-polished floors can be slick even when dry
 - Concrete
 - Marble
 - Ceramic tile
- Freshly-waxed surfaces
- Transitioning from one surface to another
 - Carpeted to vinyl
 - Grid to smooth concrete



Causes of Slips

- Sloped walking surfaces
- Loose, unanchored rugs or mats
- Loose floorboards or shifting tiles
- Wet, muddy or greasy shoes
- Ramps & gang planks without skid- or slip-resistant surfaces



Causes of Slips

- Metal surfaces
 - Dockboards & dock plates
 - Platforms
 - Sidewalk & road covers
- Mounting & dismounting vehicles & equipment
- Climbing ladders
- Loose, irregular surfaces such as gravel

Causes of Slips

- Sloped, uneven or muddy terrain
- Weather hazards
- Leaves, pine needles & other plant debris (wet or dry)



Causes of Trips

- Uncovered hoses, cables, wires or extension cords across aisles or walkways
- Clutter, obstacles in aisles, walkway & work areas
- Open cabinet, file or desk drawers & doors

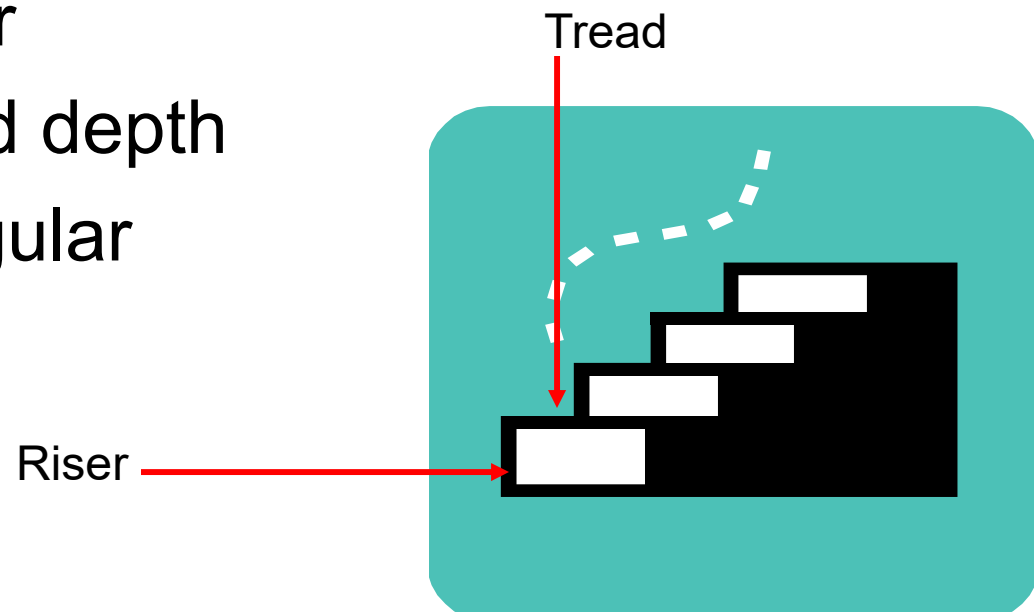


Causes of Trips

- Changes in elevation or levels
 - Unmarked steps or ramps
- Rumpled or rolled-up carpets/mats or carpets with curled edges
- Irregularities in walking surfaces
 - Thresholds or gaps
- Missing or uneven floor tiles & bricks

Causes of Trips

- Damaged steps
- Non-uniform, improper or irregular steps
 - Taller or shorter
 - Shallower tread depth
 - Otherwise irregular

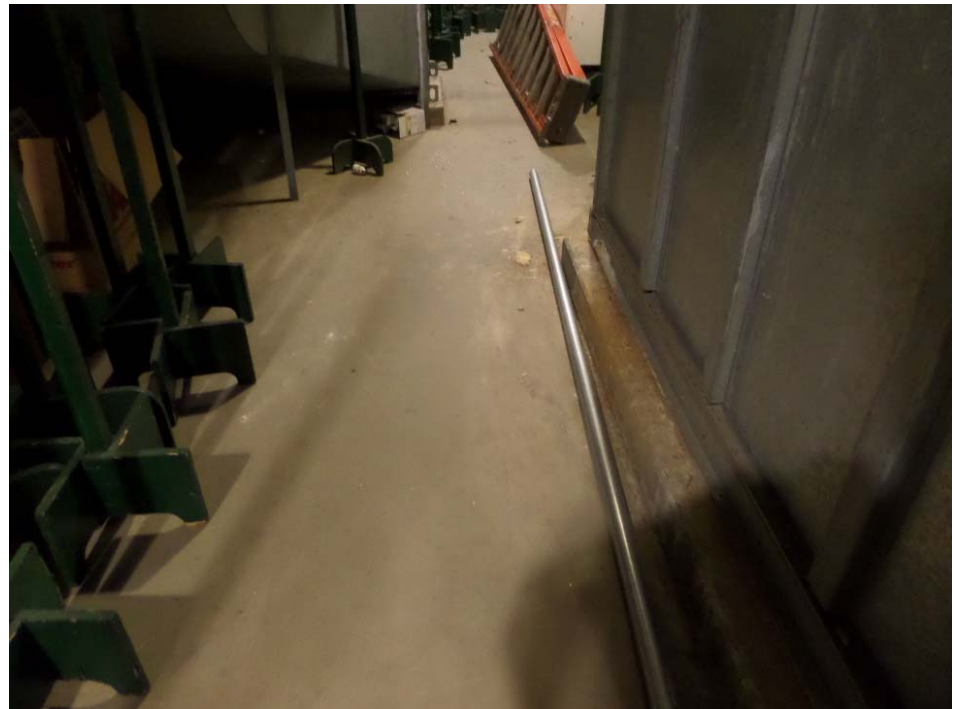


Causes of Trips

- Debris, accumulated waste materials
- Trailing cables, pallets, tools in gangways
- Objects protruding from walking surface
- Uneven surfaces
- Sidewalk/curb drops
- Speed bumps
- Tire bumpers
- Wheelchair ramps & curbs
- Driveways

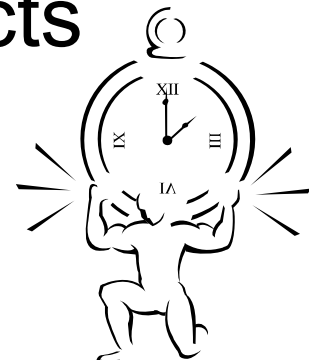
Environmental Conditions Increasing Risk of Trips & Slips

- Poor lighting
- Glare
- Shadows
- Bulky PPE (includes improper footwear)
- Excess noise or temperature
- Fog or misty conditions
- Poor housekeeping
- Improper cleaning methods & products
- Inadequate or missing signage



Human Factors Increasing Risk of Trips & Slips - Physical

- Failing eyesight &/or visual perception
- Age
- Physical condition & fatigue
- Stress or illness
- Medications, alcohol & drug effects



Human Factors Increasing Risk of Trips & Slips - Behavior

- Carrying or moving cumbersome objects or simply too many objects at one time
- Not paying attention to surroundings or walking distracted
- Taking unapproved shortcuts
- Being in a hurry and rushing



STFs are Preventable

- Wearing proper footwear
 - Wear proper footwear with good traction
- Good housekeeping
 - Maintain clear, tidy work areas free of clutter
- Safe walking practices
 - Follow safe walking practices & routes
- Learn to fall “properly”
 - There are techniques that can minimize fall injuries

Workplace/Work Process Design

- Contain work processes to prevent discharge, splatter, or spillage of liquids, oils, particles, dusts & offal onto floor
 - Local exhaust ventilation
 - Extraction/collection systems
 - Enclosures
 - Work surfaces with raised or lipped edges
 - Catch/drip pans, drain-offs

Workplace/Work Process Design

- Use adequate ventilation to avoid smoke, steam & condensation of water & grease onto floor
- Provide adequate lighting to keep work areas, aisles & paths of travel well lit

Workplace/Work Process Design

- Mark/highlight step edges & transition areas (changes in elevations)
 - Use anti-skid paint, slip-resistant coatings & strips
- Make sure stairs have sufficient lighting & hand rails
- Provide effective drainage, false floors or work platforms
- Install slip-resistant floors in high risk areas

OSHA's Regulations

29 CFR 1910 Subpart D



Housekeeping

- All places of employment clean and orderly and in a sanitary condition
- Workrooms clean & dry
- Platforms, mats, or other dry standing places for wet processes





Aisles

- Sufficient safe clearance maintained where mechanical handling equipment is used
- Aisles and passageways kept clear and in good repairs
- No obstruction across or in aisles that could create a hazard





Aisles

- Permanent aisles and passageways shall be appropriately marked.



Floor Openings

- Every stairway floor opening guarded by a standard railing
- Railing provided on all exposed sides (except at entrance to stairway)



Floor Openings

- Every ladderway floor opening or platform shall be guarded by a standard railing with standard toeboard on all exposed sides (except at entrance to opening), with the passage through the railing either provided with a swinging gate or so offset that a person cannot walk directly into the opening.



Floor Openings

- Where operating conditions necessitate the feeding of material into any hatchway or chute opening, protection shall be provided to prevent a person from falling through the opening.



Floor Openings

- Every pit and trapdoor floor opening, infrequently used, guarded by a floor opening cover of standard strength and construction.
- While the cover is not in place, the pit or trap opening constantly attended by someone or protected on all exposed sides by removable standard railings.



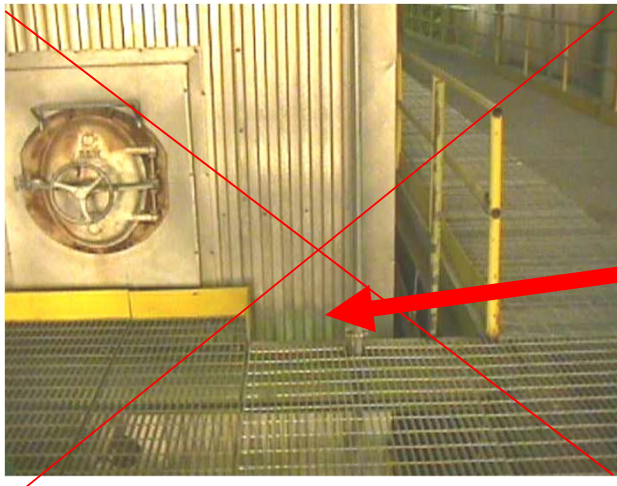
Floor Openings

- Every temporary floor opening shall have standard railings, or shall be constantly attended by someone.



Floor Openings

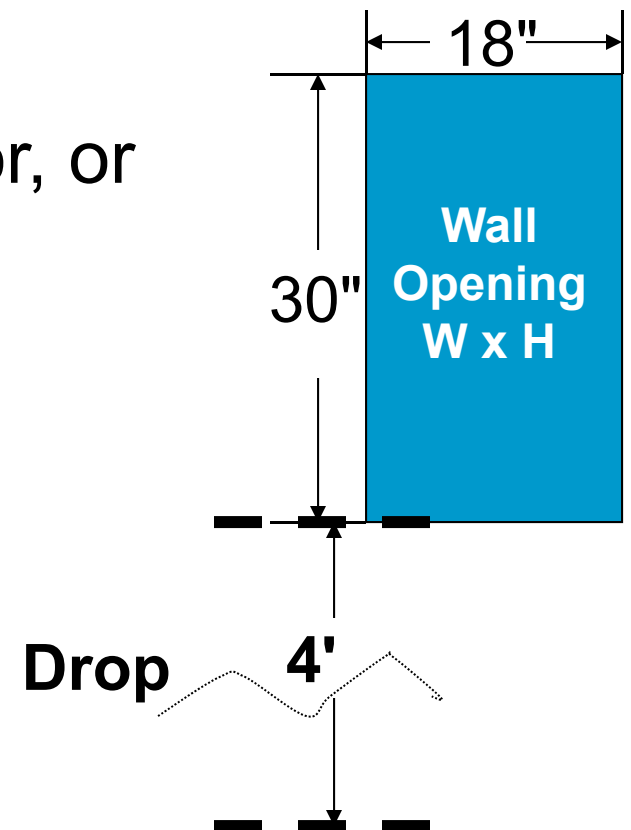
- Every floor hole into which persons can accidentally walk shall be guarded by either:
 - A standard railing with standard toeboard on all exposed sides, or
 - A floor hole cover of standard strength and construction. While the cover is not in place, the floor hole shall be constantly attended by someone or shall be protected by a removable standard railing.



**Floor opening
large enough
to fall through**

Wall Openings

- Every wall opening from which there is a drop of more than 4 feet shall be guarded by one of the following:
 - Rail, roller, picket fence, half door, or equivalent barrier.



Open-sided Floors

- Every open-sided floor or platform 4 feet or more guarded on all open sides except where there is entrance to a ramp, stairway, or fixed ladder.



Open-sided Floors

- The railing shall be provided with a toeboard wherever, beneath the open sides,
 - Persons can pass,
 - There is moving machinery, or
 - There is equipment with which falling materials could create a hazard



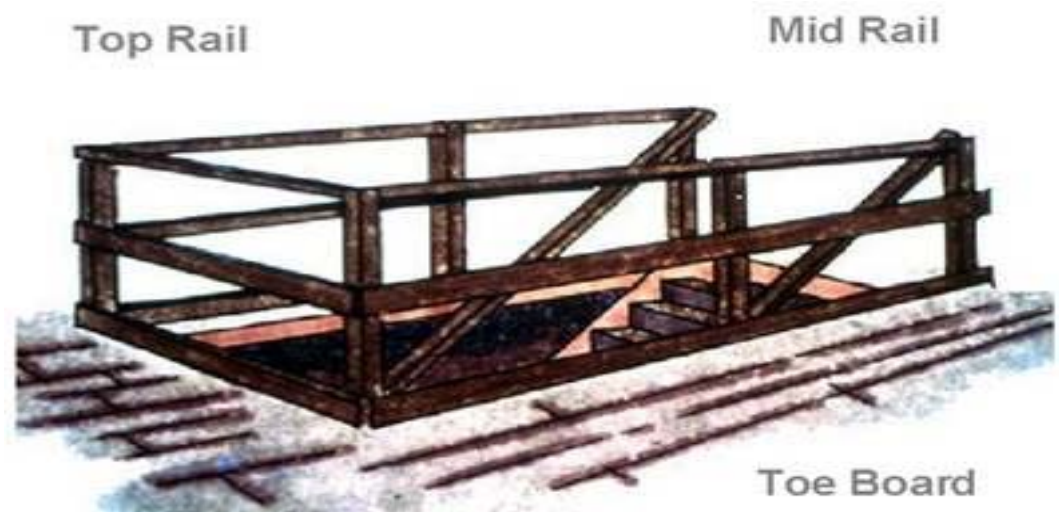
Stairways

- Every flight of stairs having four or more risers shall be equipped with standard stair railings or standard handrails.

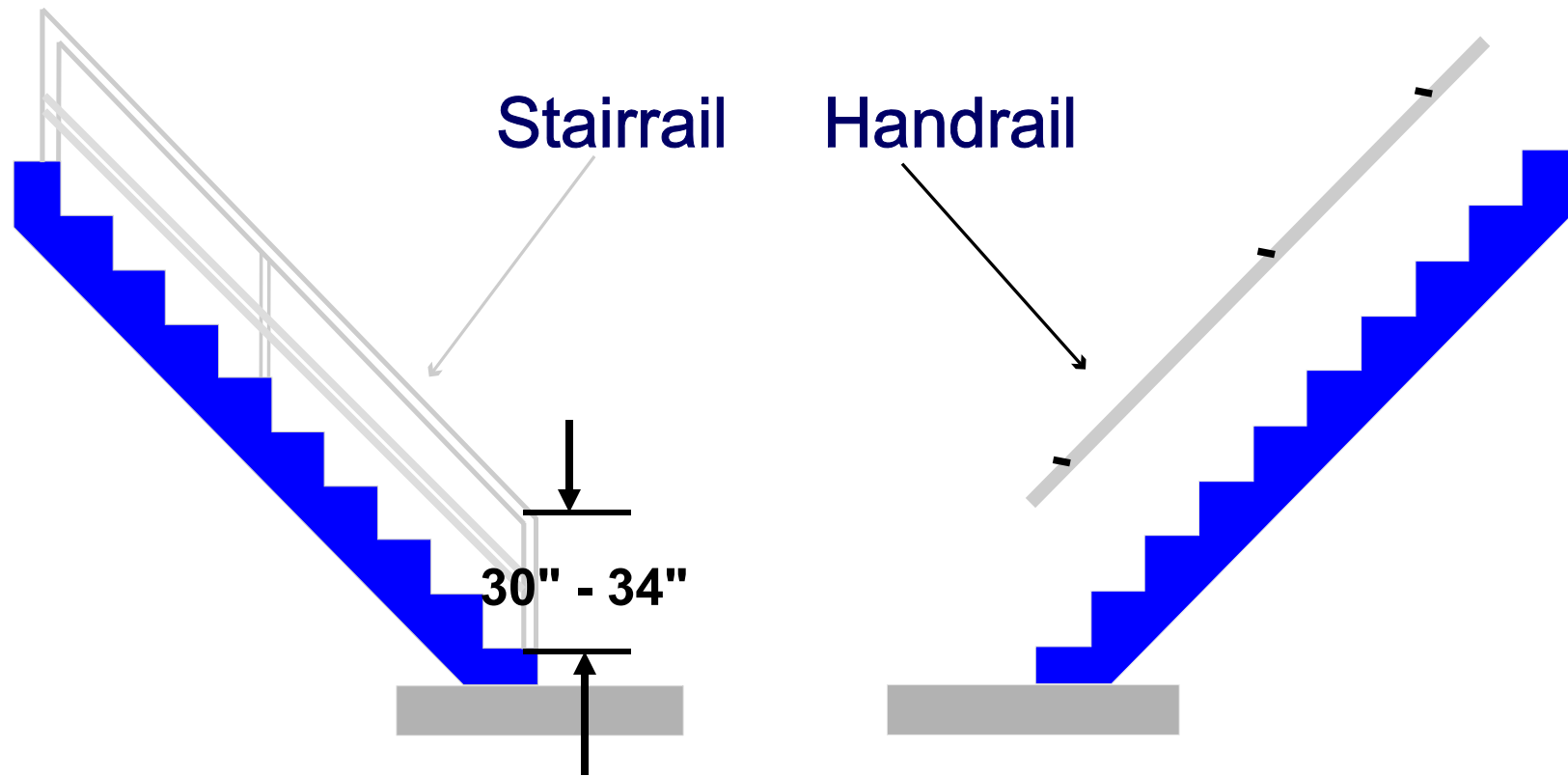


Railings

- A standard railing consists of top rail, intermediate rail, and posts
- Have a vertical height of 42 inches nominal from upper surface of top rail to floor.
- The top rail smooth-surfaced
- The ends of the rails shall not constitute a projection hazard



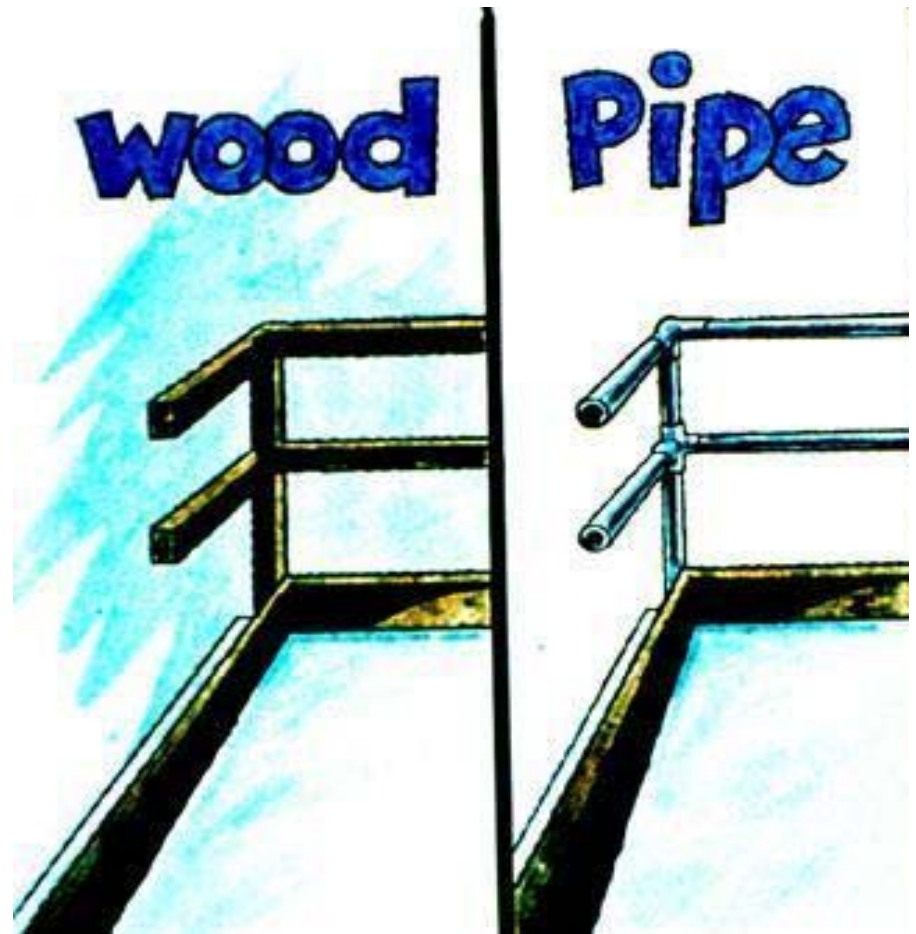
Railings



A stair railing shall be not more than 34 inches nor less than 30 inches from upper surface of top rail to surface of tread in line with face of riser at forward edge of tread.

Railings

- Wood railings, posts at least 2 by 4
- Posts $\leq$ 6 feet
- Rails, at least 2 by 4
- Pipe railings at least 1 1/2 inches nominal diameter
- Posts spaced not more than 8 feet on centers.



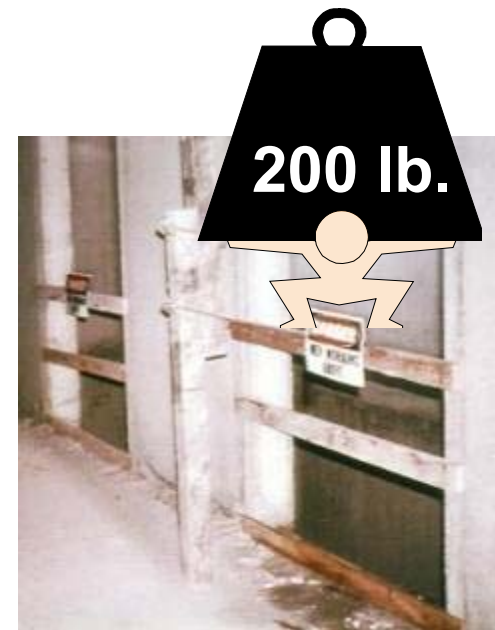
Railings

- For structural steel railings
 - Posts and top and intermediate rails 2 by 2 by $\frac{3}{8}$ inch angles
 - Posts spaced not more than 8 feet on centers.



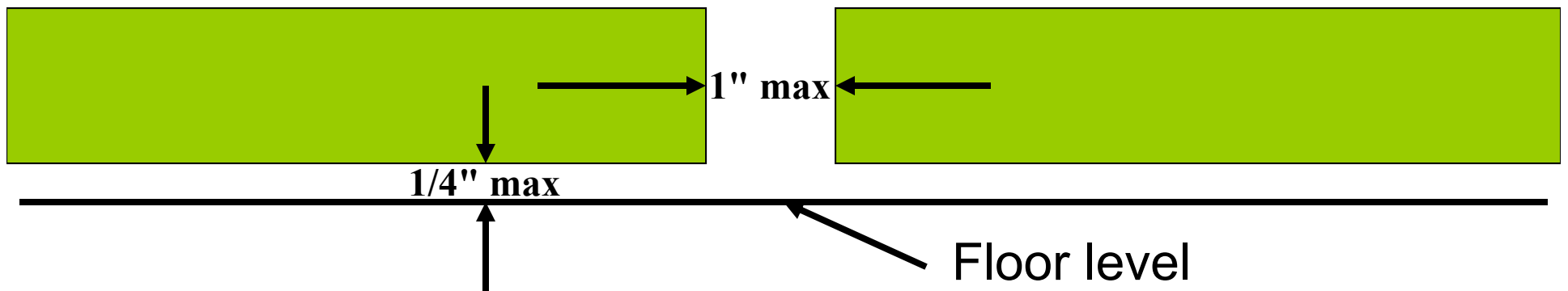
Railings

- The completed structure shall be capable of withstanding a load of at least 200 pounds applied in any direction at any point on the top rail.



Railings

- A standard toeboard 4 inches nominal in vertical height
- Securely fastened
- Not more than 1/4-inch clearance above floor level.
- Openings not over 1 inch



Railings

- Where material is piled to such height that a standard toeboard does not provide protection, paneling from floor to intermediate rail, or to top rail shall be provided.



Fixed Stairs

- Provided for regular travel between levels
- Where equipment requires attention routinely
- Fixed stairs provided where access to elevations is daily
- For work around acids, caustics, gases, or other harmful substances



Fixed Stairs

- Fixed stairs minimum width of 22 inches



Fixed Stairs

- "Stair treads." All treads shall be reasonably slip-resistant and the nosings shall be of nonslip finish.



- Rise height and tread width shall be uniform throughout any flight of stairs including any foundation structure used as one or more treads of the stairs.

Fixed Stairs

- "Stairway platforms." Stairway platforms shall be no less than the width of a stairway and a minimum of 30 inches in length measured in the direction of travel.



Fixed Stairs

- "Railings and handrails." Standard railings shall be provided on the open sides of all exposed stairways and stair platforms.
- Handrails shall be provided on at least one side of closed stairways preferably on the right side descending.



**No handrail
on stairs
leading to
machine
pit**

Portable Ladders

- All parts free from sharp edges and splinters;
- Visually acceptable
- Stepladders 20' max.
- Single ladders 30' max.



Portable Ladders

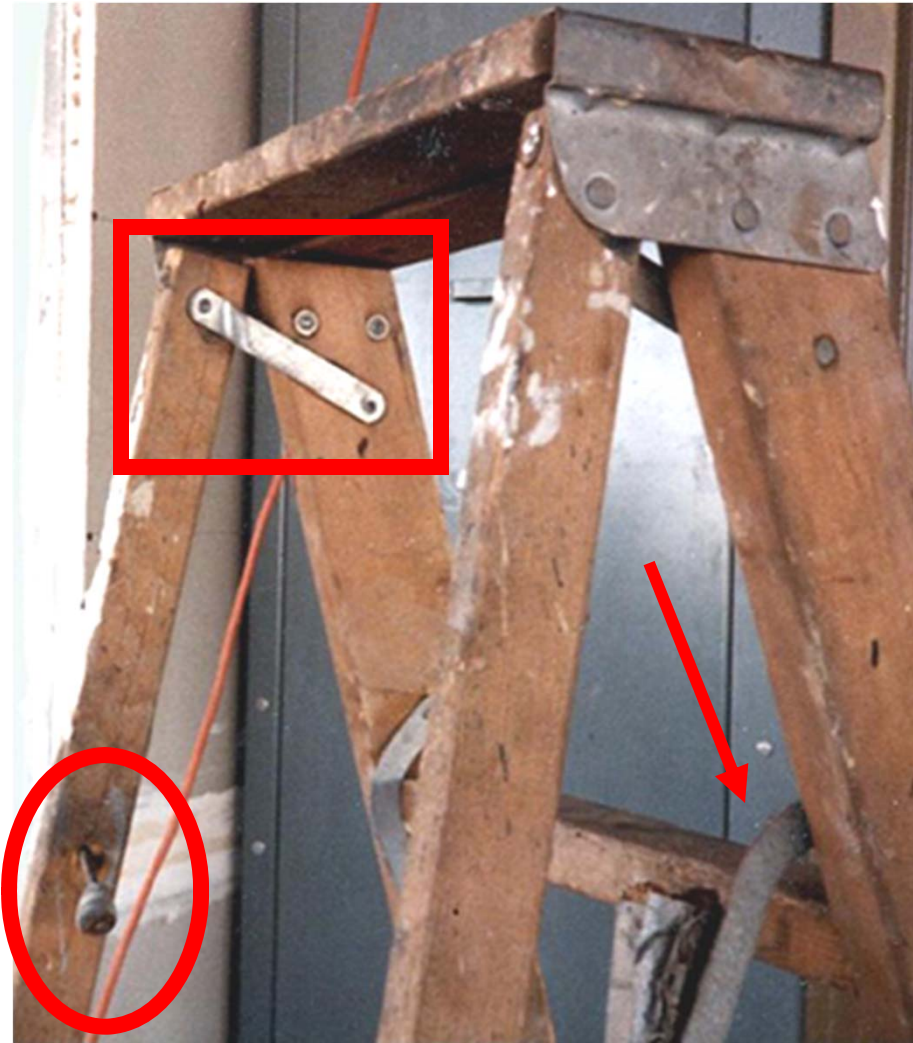
- Maintained in good conditions at all times
- Locks, wheels, pulleys frequent lubrication
- Worn rope replaced
- Safety feet and auxiliary equipment in good shape



Portable Ladders - Inspection

Ladders inspected
frequently

Those with defects
withdrawn from service
for repair or destruction
and tagged or marked
as **"Dangerous, Do
Not Use."**



Portable Ladders



- Ladders not placed in front of doors opening toward the ladder unless the door is blocked upon, locked, or guarded;

Portable Ladders

- Tops of the ordinary types of stepladders shall not be used as steps

