

Slips Trips and Falls Walking-Working Surfaces





What we'll cover

- Slip Trip and Fall Data
- Definitions
- Causes and common examples
- OSHA's Walking Working Surfaces
- Prevention



2017 Bureau of Labor Statistics (BLS) Non-fatal accident causes

0	Over exertion and bodily reaction	295,830
0	Contact with objects or equipment	229,170
0	Falls, Slips, Trips	227,760
0	Transportation	47,910
0	Violence	39,750



2017 Bureau of Labor Statistics (BLS) Fatal accident causes

		<u>US</u>	<u>Ohio</u>
0	Total	5147	174
0	Transportation related	2077	52
0	Falls, Slips, Trips	887	31
0	Violence	807	32
0	Contact with objects or equipment	695	24
0	Exposure to harmful substances/environment	531	28



2017 BLS Data

Non-Fatal Injuries:

- Falls to lower level: 47,180 (5.3%)
- Falls to same level: 142,770 (16.2%)
- Slips/Trips no fall: 33,720 (3.8%)

Total: 25.3% of Injuries

Fatalities:

- Fatal fall to lower level: 713 (13.8%)
- Fatal fall to same level: 174 (3.4%)

Total: 17.2% of Fatalities



Percent of fatal falls to lower level by height of fall, 2017



- A total of 713 work-related fatal falls to lower level were recorded in 2017, up 2 percent from 2016.
- Of the cases where height of fall was known (614 cases), 48 percent were falls of 15 feet or less.
- About one in five falls with a known height were from more than 30 feet.

View data



Slips, Trips and Falls *National Safety Council*

\$7.7 Billion costs associated with STF's

104 Million lost workdays/year



2018 OSHA most cited standards

- 1. Fall Protection (1926.501)
- 2. Hazard Communication (1910.1200)
- 3. Scaffolding General Requirements (1926.451)
- 4. Respiratory Protection (1910.134)
- 5. Control of Hazardous Energy Lockout/Tagout (1910.147)
- 6. Ladders (1926.1053)
- 7. Powered Industrial Trucks (1910.178)
- 8. Fall Protection Training Requirements (1926.503)
- 9. Machine Guarding– General Requirement (1910.212)
- 10. Personal Protective/Lifesaving Equipment Eye/Face Protection (1926.102)



What are slips, trips & falls?



A slip occurs when there is too little traction or friction between the shoe and walking surface.







A trip occurs when a person's foot contacts an object in their way or drops to a lower level unexpectedly, causing them to be thrown off-balance.





A fall occurs when you are too far off balance.





There are two types of falls:

Same Level

When you fall to the surface you are walking on. Same level falls are more common.

Caused by: • Slips • Trips



From Elevation

When you fall to a level below the one you are walking on. Falls from elevation are more severe.

Caused by: · Ladders

Stairs

Platforms

Loading docks

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STF – Some Common Causes

- Wet, Oil, Snow, Ice, Mud
- Sloped or Uneven Floors
- Polished Floors
- Poor Lighting
- Dust/Powders/Particulates
- Non-Uniform Stairs
- Transition of Flooring
- Loose Rugs



 Wet spills or contamination on floors: water, mud, oil, grease, food, etc.



Dry contamination
 on floors:
 dusts, powders, wood,
 lint, plastic, etc.





 Highly polished floors especially marble, terrazzo or ceramic tile



- Freshly waxed floors
- Transitioning from one surface to another
 e.g., carpeted to a smooth
 surface





Sloped walking surfaces

- Loose, unanchored mats or rugs
- Loose tiles or floorboards that can shift
- Wet, muddy or greasy shoes







- Ramps without skid or slip resistant surfaces
- Metal surfaces such as platforms, construction plates or covers on sidewalks or roads

Metal has lower traction than many other surfaces, so it can become very smooth with wear, becoming even more hazardous when wet or frosty.





 Mounting and dismounting equipment such as trucks, trailers, lawn mowers and other heavy equipment

 Climbing up and down ladders

> Add water, mud or grease to any of these surfaces and they become even more of a hazard.







Causes of Trips

- Uncovered cables, wires or extension cords (temporary wiring)
- Clutter, obstacles in walkways
- Open cabinets or desk drawers







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Causes of Trips

- Changes in elevation, e.g. unmarked steps
- Carpets or mats that are not lying flat or have rolled up edges



- Missing or uneven floor tiles
- Irregular walking surfaces





Causes of Trips

Damaged steps



 Non-uniform or irregular steps: varying tread depth, varying height or otherwise uneven







Conditions increasing the risk of slips, trips and falls

Conditions in the surrounding environment can have a huge impact on slip, trip and fall hazards.

- Poor lighting
- o Glare
- Using bulky equipment or awkward PPEs





- Loud noise or distraction
- Temperature, humidity or precipitation
 - Traffic type or volume



Conditions increasing the risk of slips, trips and falls

Task factors also have an impact on the risk for accidents.

Object carried

Carrying too much at one time or carrying awkward objects

- Pushing or pulling objects
- Change in elevation or direction while walking



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Conditions increasing the risk of slips, trips and falls

- o Age
- Body shape, size and mass
- Gait dynamics
- Physical condition, illness
- Psychological factors, stress and distractions
- Medications, alcohol or drug effects
- Visual perception, eyesight









Human factors increasing the risk of slips, trips and falls

Human behaviors have an impact on the risk for accidents.

- Carrying too much at once or carrying awkward objects, preventing you from:
 - Seeing where you are going
 - Holding onto railings
 - Keeping your balance





Human factors increasing the risk of slips, trips and falls

Inattentive walking

Using a cell phone, reading, talking and not watching where you are going while walking (distracted walking)

- Taking shortcuts
 Not using clear pathways or designated walkways
- Being in a hurry







Human factors increasing the risk of slips, trips and falls

Poor housekeeping Allowing clutter to accumulate, not cleaning up spills in a timely manner

Using improper cleaning processes

Over-using wax or polish on floors, using water to clean up a grease spill

 Failing to use signs when slip, trip and fall hazards are present







Human factors increasing the risk of slips, trips and falls

Use of footwear not suitable for work environment or environmental conditions.





Smooth surfaced soles



Old, worn-out shoes

High heels



29 CFR Part 1910 Subpart D Walking-Working Surfaces

- Effective Date: January 17, 2017
- Major Changes
 - Aligns better with Construction Standards
 - Provides more choice for fall protection
 - Adds option of personal fall protection systems
 - Clarifies ladder requirements
 - Requires workplace Inspections
 - Requires employee training



WWS 2017

- 1910.21 Scope and Definitions
- 1910.22 General Requirements
- 1910.23 Ladders
- 1910.24 Step Bolts & Manhole steps
- 1910.25 Stairways
- 1910.26 Dock Boards



WWS 2017

- 1910.27 Scaffold and Rope Descent Systems
- Igentication 1910.28 Duty to Have Fall Protection & Falling Object Protection
- Ight and Protection Systems & Falling Object Protection-Criteria and Practice
- 1910.30 Training Requirements



1910.21 Scope & Definitions

Walking-working surface means <u>any</u> horizontal or vertical surface on or through which an employee walks, works, or gains access to a work area or workplace location



1910.22 General requirements

- All areas of employment should be kept clean, orderly, and sanitary
- Floors shall be kept clean and dry to extent feasible
- Wet processes require drainage, grating, mats, false floors or raised platforms
- Support maximum intended load
- Inspected regularly and as necessary and maintained in safe condition
- Hazardous conditions corrected or repaired before use or guarded to prevent access until repairs are made.

1910.23 Ladders

- Ladder rungs parallel, level and uniformly spaced
- Used only for purposes for which they were designed
- Inspected before initial use in each work shift
- Any ladder with structural or other defects is immediately tagged "Dangerous: Do Not Use"
- Rungs/steps of metal ladders are corrugated, knurled, dimpled, coated with skid-resistant material
- Not loaded beyond the maximum intended load
- Used only on stable and level surfaces unless they are secured or stabilized
- Extend at least 3 feet (0.9 m) above the upper landing surface
- Also covers fixed ladders and mobile ladder stands



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Ladder Safety





Ladder Angle Portable Rung and Cleat Ladders

Use at angle where the horizontal distance from the top support to the foot of the ladder is 1⁄4 the working length of the ladder (length along ladder between the foot and top support).





Portable Ladders

- Ladders used to gain access to a roof or other area must extend at least 3 feet above the point of support
- Withdraw defective ladders from service and tag or mark "Dangerous, Do Not Use"
- Never use ladders in a horizontal position as scaffolds or work platforms
- Never use metal ladders near electrical equipment








Fixed Ladders – Fall Protection 24 feet or higher

- Existing (before Nov 19, 2018)
 - Personal Fall Arrest System, Ladder Safety System, Cage or Well
- New (on or after Nov 19, 2018)
 - Personal Fall Arrest System or Ladder Safety System
- After Nov 19, 2036 all must follow new standard









1910.24 - Step bolts and manhole steps

- Installed on or after January 17, 2017
- Capable of supporting at least four times its maximum intended load
- Constructed of, or coated with, material that protects against corrosion
- Corrugated, knurled, dimpled, or other surface that minimizes the possibility of an employee slipping
- Minimum perpendicular distance is 7 inches from nearest obstruction (4.5" if obstruction in not avoidable)
- Inspected at the start of the work shift and maintained in accordance with 1910.22







1910.25 - Stairways

- Handrails, stair rail, guardrail systems are provided in accordance with 1910.28
- Vertical clearance above any stair tread to any overhead obstruction is at least 6 feet, 8 inches
- Uniform riser heights and tread depths
- Standard stairs installed at angles between 30 to 50 degrees
- Support at least five times the normal anticipated live load, but never less than 1,000 pounds



Stairways

- Flights of stairs with four or more risers must have stair railings or handrails.
- Landings 4 feet or greater needs guardrail or stair rail.





Stairways

- Highlight step edges and transitions with anti-skid paint
- Make sure stairways have sufficient lighting and handrails

If stairway is not often used and not always lit, make sure access to light switches is readily available at both top and bottom or stairwell







1910.26 - Dockboards

- Capable of supporting the maximum intended load
- Dockboards put into initial service on or after January 17, 2017 are designed, constructed, and maintained to prevent transfer vehicles from running off the dockboard edge
- Secured or anchored in place to prevent moving out of a safe position
- Measures such as wheel chocks to prevent the transport vehicle from moving
- Equipped with handholds or other means to permit safe handling





1910.27 - Scaffolds and rope descent systems

- Scaffolds used in general industry must meet the requirements in 29 CFR part 1926, subpart L (Scaffolds)
- Rope descent systems-
 - Before any rope descent system is used, the building owner must inform the employer, in writing that the building owner has identified, tested, certified, and maintained each anchorage so it is capable of supporting at least 5,000 pounds
 - The information must be based on an annual inspection by a qualified person and certification of each anchorage by a qualified person, as necessary, and at least every 10 years.
 - Implemented no later than November 20, 2017

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1910.27 - Rope descent systems – cont:

- No rope descent system is used for heights greater than 300 feet
- Used in accordance with instructions, warnings, and design limitations
- Each employee who uses the rope descent system is trained in accordance with 1910.30
- Rope descent system is inspected at the start of each workshift
- Each employee uses a separate, independent personal fall arrest system
- Prompt rescue of each employee is provided in the event of a fall
- Ropes of each rope descent system are protected
- Equipment, tools, squeegees, or buckets, secured by a tool lanyard or similar method to prevent it from falling
- No employee uses a rope descent system when hazardous weather conditions



Scaffolding General Requirements

- Must be capable of supporting four times the maximum intended load
- Do not alter or move while in use
- Protect workers on scaffolds from overhead hazards
- If higher than 10 ft., use guardrails, midrails and toeboards
- Use wire mesh between the toeboard and guardrail if people work or pass underneath
- Must be equipped with access ladder or equivalent
 OSHA Office of Training and Education









Rope descent system





- requires employers to provide protection for each employee exposed to fall and falling object hazards Except....
 - Portable Ladders
 - When inspecting, investigating, or assessing workplace conditions prior to starting work or after all work has be completed
 - Entertainment Stages & Rail Station Platforms
 - Powered Platforms & Arial Lifts
 - Telecommunication and Electrical Distribution



- Any side or edge that is 4 feet or more above a lower level is protected by:
 - guardrail systems
 - safety net systems
 - personal fall arrest, travel restraint, or positioning systems



- Areas to be guarded include:
 - Unprotected sides or edges 4-feet or greater
 - Hoist areas
 - Holes
 - Dockboards
 - Runways/walkways
 - Dangerous equipment
 - Wall openings with bottom edge less than 39 inches and fall hazard of 4 feet or more
 - Repair/service/assembly pit



- Areas to be guarded include:
 - Fixed ladders more than 24 feet
 - Outdoor advertising (billboards)
 - Stairways
 - Scaffolds and rope descent systems
 - Work on low-slope roofs
 - Slaughtering facility platforms
 - Walking-working surfaces not otherwise addressed



- When an employee is exposed to falling objects
 - o ensure that each employee wears head protection
 - erecting toeboards, screens, or guardrail systems to prevent objects from falling to a lower level
 - erecting canopy structures
 - barricading the area into which objects could fall
 - keeping objects far enough from an edge or opening to prevent them from falling to a lower level

1910.29 - Fall protection systems and falling object protection-criteria and practices

- Guardrail systems
- Safety net systems
- Designated areas
- Covers
- Handrails and stair rail systems
- Cages, wells, and platforms used with fixed ladders
- Outdoor advertising
- Ladder safety systems
- Personal fall protection systems
- Protection from falling objects
- Grab handles

1910.30 - Training requirements

- Provide training for each employee who uses personal fall protection systems
- Ensure employees are trained on or before May 17, 2017
- Training conducted a qualified person
 - How to recognize fall hazards in the work area
 - Procedures to be followed to minimize those hazards
 - Correct use of personal fall protection systems and equipment
 - Proper care, inspection, storage, and use of equipment
 - Training must be understandable



Hazard - Unprotected Sides and Edges

Equal to or greater than 4 feet

- Guardrail System
- Safety Net System
- PFAS, Travel Restraint, or Positioning System





Guardrail System

- Top rail: 42 inches +/- 3 inches; 200 lbs force downward or outward direction
- Midrail: Midway between top edge of top rail and walking-working surface: 150 lbs force downward or outward
- 0.25 inches in thickness
- Smooth surface



Protection From Falling Objects - Toeboard

- Sufficient Length to protect
- Minimum height of 3.5 inches
- A bottom gap of no more than 1/4 inch
- No between gaps to exceed 1 inch
- Withstand 50 lbs of force
- Install screening if materials or tools exceed height of toeboard and/or midrail

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Hazard - Hole (formerly floor opening)

A gap or open space in a floor, roof, walking working surface, or similar surface that is at least 2 inches in its least dimension.

Covers

- Supports twice the maximum intended load
- Must be secured



Hazard - Openings (wall openings)

- Gap or space in wall at least 30" high x 18" wide through which persons may fall; AND Bottom edge of opening is less than 39" high; AND Outside bottom edge of opening is 4 feet or more from the lower level
- Then Must Use Fall Protection
 - Guardrail
 - Safety Net
 - Travel Restraint or
 - PFAS









Repair/Service/Assembly Line Pits

- Less than 10 feet no fall protection if:
- Limit access within 6-ft to authorized employees
- Apply floor markings or lines 6-ft from edge
- Post Signs "Caution-Open Pit"





Slips, trips and falls are preventable!

- Modify workspaces and work practices to reduce hazards – avoid distractions!
- Practice good housekeeping
- Wear proper footwear
- Use ladders and stairs with caution
- Practice safe walking procedures



- Modify work processes to reduce splatter, spill or release of dusts, particles, oils or liquids onto floor via:
 - Ventilation
 - Enclosures
 - Work surfaces with raised edges
 - Drain offs





 Perform regular check-ups and maintenance on machinery to avoid leaks



Use anti-slip coating and tape where applicable



Stairs with anti-skid coating and highlighted edges.



Ramp with anti-skid coating and highlighted edges.



Use anti-slip mats where slip hazards are present or where wet processes are used







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Workspace and work practice design

- Use drainage or false floors where needed
- Use slip-resistant floor in high risk areas like entrances







Highlight slip and trip hazards for better visibility









Housekeeping

- Keep walkways, aisles and stairs clear of clutter
- Cover or secure cords, cables, wires or hoses and keep them away from high traffic areas Better yet, use cordless tools
- Make sure rugs lay flat and secure



A warehouse with clear, well-defined walkways.


Housekeeping

 Close desk, cabinet and file drawers after use

Keep floors around the Ο workspace free of cords, boxes, materials, papers and other objects



An clutter-free, organized office space.



Housekeeping

- Keep floors free of mud, water, grease and debris
- Clean up spills immediately
- Block off contaminated area and continue to use caution signs while the floor is drying



Note: Be sure not to overuse "Wet Floor" or "Caution" signs, if they become a part of the 'scenery', they may not be taken seriously when there really is a hazard.



Housekeeping

 Clean surface areas regularly as recommended, following appropriate cleaning and drying procedures

 Repair or replace any damaged flooring as necessary







- Pay attention to your surroundings, look where you are going and pay attention to slip and trip hazards
- Walk, don't run take your time
- Don't read, write or work while walking
- Use handrails while ascending and descending stairs, take your time and don't skip steps
- Bring a flashlight with you if you are going into a dim area



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Safe Walking Procedures

- Before you lift anything, check to make sure your path is clear and your view is not obstructed
- Utilize carts don't carry anything that you cannot see over or around
- Carry small loads close to your body
- Use the elevator if you are going to another level and are carrying something that requires you to use both hands







Safe Walking Procedures

- Walk cautiously when you transition from one walking surface to another
- Slow down and take small steps when a surface is cluttered, uneven or at an angle
- Wear stable non-slip shoes





Safe Walking Procedures

If you must walk on a slippery surface:

- Wear non-slip footwear
- Pay attention to the surface you are walking on
- Take small, slow steps
- Point your feet out slightly to keep your center of balance under you
- Use handrails or other stable objects you can hold onto



Mounting & Dismounting Equipment Safely

- Make sure your shoes are clean of any mud, snow, grease or any other slippery substance
- Make sure the step, foothold or platform that you will be using is also clean, free of defects and properly secured
- Always face the equipment when mounting or dismounting
- Have a firm hold with your hands and step up, placing your foothold under the arch





Mounting & Dismounting Equipment Safely







Keep three points of contact at all times

Three points of contact

one hand, two feet two hands, one foot

Do not jump off while dismounting – **step down carefully** while facing the equipment





Follow the same procedure for ascending and descending ladders as for mounting and dismounting equipment

- Make sure footwear is clean and dry
- Make sure ladder is safe and the rungs are clean and dry
- Face the ladder at all times
- Maintain three points of contact
- Place your foot on the step or rung under the ball of your foot





Ladder Safety

- Inspect ladders before using
- Set up ladders or step stools on firm, solid ground
- Use the right height ladder for the job
- Use a 4-to-1 ratio when setting up a single or extension ladder
 For example: place a 12 foot ladder so tha the bottom is 3 feet away from the object (the ladder is leaning against)
- If the ladder is set up in passageways (or areas with traffic, secure the ladder and block off the area





Ladder Don'ts











Don't attempt to use a broken or damaged ladder

Do not climb higher than the third rung from

- the top on extension ladders, or the
- second tread from the top on stepladders



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Ladder Don'ts



Never lean too far to the sides, keep your hips in the center of the ladder



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Ladder Don'ts



Don't use ladders near power lines or electrical hazards, even dirty or wood ladders can conduct electricity



Don't use a ladder that's not set up with a four to one ratio or not on a solid base





- Slips, trips, and falls constitute the majority of general industry accidents
- OSHA's standards for walking and working surfaces include requirements for housekeeping, guarding floor and wall openings and holes, industrial stairs and ladders
- Keeping working surfaces clean, dry, and uncluttered can prevent many workplace accidents
- Train employees



Rules of Thumb...



If you drop it, pick it up.

If you spill it, wipe it up.

Go where you are looking, and look where you are going.

There is always time for safety !



