

Slip, Trip and Fall Risk Management Guide

Slips, trips and falls are a leading cause of accidents and/or injuries at businesses and workplaces. The National Safety Council estimates that 25,000 slip and fall accidents occur daily in the U.S., accounting for 15 percent of all workplace accidents. According to the Occupational Safety & Health Administration (OSHA), these accidents are second only to motor vehicles as a cause of accidental fatalities. It is a common misconception that slip and fall injuries “just happen” and that there is little that can be done to prevent them. Slip, trip and fall prevention programs can help reduce the number of injuries and associated loss costs.



Prevention Program – General Principles

The risk of injury resulting from a slip, trip and/or fall is a concern for any business that involves considerable foot traffic. Most people who are injured by slips, trips and falls each year fall during common, everyday activities, whether related to their job function or while visiting a business or facility. Employees, customers, contractors, and visitors could be exposed to a slip, trip and fall injury particularly where unsafe conditions exist. Slips, trips and falls may occur on level walking surfaces as well as on ramps and stairways. Major hazards associated with slip, trip and fall injuries are slippery surfaces, holes or broken surfaces, poor drainage or inadequate cleanup of spills or mud, ice, and water during inclement weather. Falls are frequently the result of both unsafe conditions and unsafe acts. Personal factors such as age, illness, emotional state, fatigue, inattention, and poor vision may also contribute to falls.

Three main components are important in reducing slips, trips and falls – walking surface design, walking surface maintenance, and awareness training. An effective prevention plan can help reduce the risk of slips, trips and falls at your business and on your premises. The following offers several basic principles to consider in your slip, trip and fall prevention program:

- Develop and implement a slip, trip and fall risk control prevention policy. Your policy should address management commitment to reducing the risks of these accidents and injuries, along with identifying the parties responsible for the implementation of this policy.
- Educate employees on slip, trip and fall hazards. Enlist the support and assistance of your employees to help prevent, identify and report hazards.
- Conduct periodic walkthrough surveys of your premises to help you keep your property and buildings in a safe condition. The results of walkthrough inspections should be documented. Discuss with management any specific deficiencies observed, and remedy them in a timely manner. Pay special attention to:
 - > Building entrances where water, mud, grit and dirt are tracked in;

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- > Loading platforms that may be open to the elements;
- > Work areas around machinery or office equipment, and
- > Areas where floor level changes due to step or ramps.
- Choose the right floor surface. Floor surfaces and materials may contribute to slips and falls. Proper choices in flooring materials, use of special finishes, mats, tapes, grooving, texturing and keeping the floor clean and dry can help prevent slips and falls. Terrazzo, marble, ceramic tile, painted wood or concrete, metal and some vinyl floors may be slippery unless non-slip measures are taken. Carpet is less slippery. Safety, appearance, initial cost, durability and maintenance costs should be considered in the selection of flooring type.
- Maintain your property and buildings to reduce potential slip, trip and fall hazards. All flooring surfaces should be well maintained at all times. Areas such as walkways, aisles, and passageways are of special concern due to the high volume of traffic they receive. Substandard flooring surfaces can increase the risk of accidents and/or injuries. You should be aware of and remedy any unsafe conditions such as holes or broken areas, poor drainage or inadequate cleanup of spills, and insufficient removal of mud, ice or water during inclement weather.
- Follow good housekeeping practices to help reduce the frequency and severity of slip, trip and fall type injuries. Spills that go untreated, clutter and/or debris in walkways, and flooring surfaces in disrepair can increase the risk of accidents and/or injuries. Best practices should include, but are not limited to:
 - > Use slip-resistant floor treatments.
 - > Apply floor treatment to manufacturer's instructions.
 - > Use "wet floor" signs to warn of known hazards.
 - > Mop during times of low traffic.
 - > Document maintenance procedures.
- Keep materials used to prevent slips, such as floor mats, well maintained. These materials can become a hazard if good housekeeping is not followed. While completing regular walk-around surveys, look for mats with curled edges, tears or warps, and remedy these conditions in a timely manner. Mats may become saturated or dirty which can make the soles of shoes wet and dirty rather than drying and cleaning them. This can result in an increased hazard. Your slip, trip and fall policy should include cleaning schedules for all floor mats.
- Conduct thorough investigations when a slip, trip or fall accident and/or injury occurs. A prompt, thorough accident investigation may help control exposures that could lead to future incidents and may also help control the severity of claims. The knowledge gained from thorough and accurate accident investigations can help you detect opportunities to improve your slip, trip and fall loss control program. Best practices should include, but are not limited to.
 - > Keep an accident investigation kit on premises. This kit should include accident investigation forms, a digital camera, a pen, tape measure and some barrier tape to secure the area, if necessary.
 - > Review of closed circuit television security records should be a part of the investigation. They should be preserved to document conditions.

Floors, aisles and passageways; sidewalks and parking lots; and stairways and ramps share similar hazards. They also have unique hazards based on the walking surface type. OSHA determines guidelines governing the condition of floors, stairs and other walking and working surfaces. The standard, ANSI/ASSE A1264.2-2001 Standard for the Provision of Slip Resistance on Walking/Working Surfaces provides compliance guidance. The National Fire Protection Association (NFPA) and other organizations determine building codes concerning stairs and ramps. The Americans with Disabilities Act (ADA) also has walking surface accessibility regulations to allow for wheelchair traction and freedom of movement for people with disabilities. These regulations can help result in safer conditions for everyone, not just those covered by the ADA.

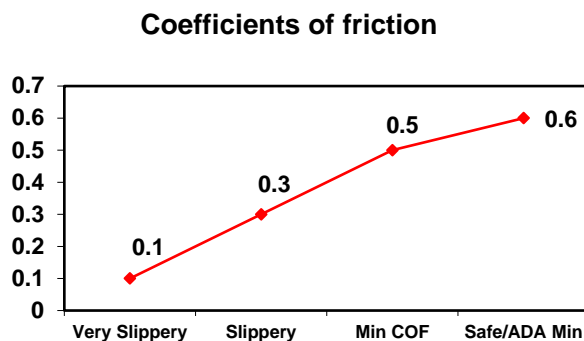
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Floors, Aisles and Passageways

Floors, aisles, and passageways are of concern because they are high-traffic areas. Slippery surfaces can occur from applying polymer over wax dressing; allowing inadequate drying time; buffing to a mirror-like gloss; incomplete removal of grease or oil; or allowing cleaning residue to mix with freshly applied finishes. Substandard floors can multiply the risk of accidents.

Coefficient of Friction (COF)

The coefficient of friction (COF) measures the slipperiness of a walking surface. COF refers to the ratio of the force required to move one surface over another to the total force pressing the two surfaces together. A higher COF results in a greater slip resistance.



Codes and Regulations

The Occupational Safety and Health Administration (OSHA) 29 CFR 1910.22 requires floors and aisles to be clean and dry. It is advised that floor surfaces be free of recognized hazards and if the surface cannot be maintained free of hazards such as snow, ice or oil, there should be a means to minimize exposure. Consensus standards referenced by OSHA are American National Standards Institute (ANSI) A1264.2 2001 Standard for the Provision of Slip Resistance on Walking – Working Surfaces, and American Society for Testing and Materials (ASTM) F 1637 – 95 Standard Practice for Safe Walking Surfaces. Regular inspection and maintenance should keep the surfaces in safe condition.

Exposure Controls

The following practices are considerations to help reduce the slip, trip and fall exposure:

- Build or dress floors with slip-resistant material. The coefficient of friction (COF) of the floor should not be less than 0.50. The material should be suited to the uses and processes of the area.
- Do not wax, polish or treat floors in any way that compromises their slip resistance by causing their coefficient of friction to become lower than 0.50.
- Mark permanent aisles and passageways as such to prevent them from being used as storage areas. Have proper clearance around obstacles. NFPA standards require access to be kept clear to fire alarms and extinguishing equipment.
- Keep floors clear and clean at all times. Where wet processes are used, install proper drainage and dry standing places, such as false doors, platforms, or mats, where practical, should be used where wet processes are used.
- Keep carpet in good repair, and attach securely to the ground or floor surface. Fasten exposed edges to floor surfaces, and include trim along the entire length of the exposed edge. Loose, worn or torn carpeting should be immediately replaced.
- Block off any section of floors, aisles or passageways in need of repairs. If this is not possible, warning signs should be placed near the area to alert people of the hazard.
- Clean up non-hazardous spills immediately. If a hazardous material is spilled, government regulations are to be followed. Until a spill can be cleaned, block off the section of the floor, and set up warning signs.

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- Keep aisles and passageways well lit whenever in use.
- Where mechanical handling equipment is used, allow sufficient safe clearances for aisles, at loading docks, through doorways and wherever turns or passage must be made. Consult the equipment manufacturer for guidance on recommended placement, clearances and related safety information.
- Complete monthly inspections of floors, aisles and passageways. Complete and retain the inspection sheet upon completion of your inspection. See the set of slip, trip and fall checklists under [“Travelers Sample Checklists”](#) in MyWorkroom on the Risk Control website. Customer logon is required.
- Correct deficiencies immediately.

Stairways, Ramps and Change in Level

Stairway and ramp falls present a special hazard because the change in level can result in a severe injury. Many of these falls may occur where stairs, ramps, handrails and guardrails are in substandard condition. It is important to maintain stairs, ramps, handrails and guardrails in good condition.

Exposure Controls

The following practices are considerations to help reduce the slip, trip and fall exposure:

- Keep stairways and ramps well lit when in use.
- Keep stairways and ramps unobstructed at all times. Construct curb ramps to prevent obstruction from parked vehicles.
- Confirm that your stairways have uniform riser heights and uniform riser tread depths – stair treads not less than 11 inches in depth, measured from nose to riser
- Ensure stairway and ramp walking surfaces have a coefficient of friction of 0.50 or greater.
- Keep carpet in good repair and securely attached to the stair or ramp surface, with exposed edges fastened to floor surfaces. Trim should be installed along the entire length of the exposed edge. Loose, worn or torn carpeting should be immediately replaced.
- Indoor stairways and ramps should be kept dry at all times. Clean spills on stairs and ramps immediately. Set up “wet floor” signs to warn of the hazard until the spill is cleaned.
- Design outdoor stairways and ramps so liquid cannot significantly accumulate. Proper accommodations for snow removal should be made.
- Complete monthly inspections of floors, aisles and passageways. Correct deficiencies immediately. Complete and retain the inspection sheet upon completion of your inspection.

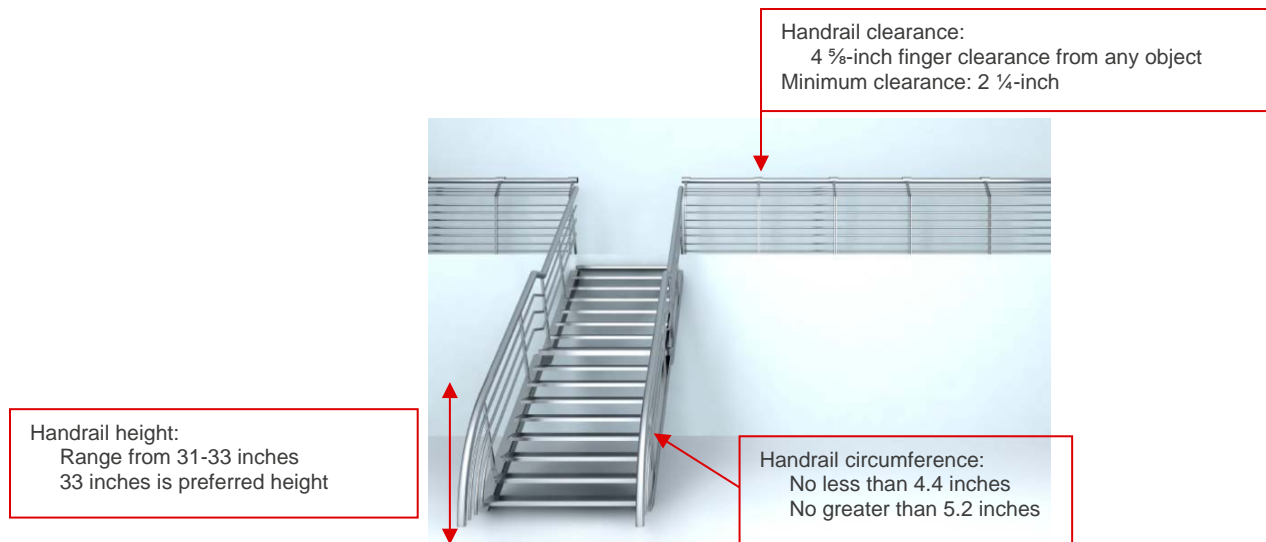
Handrails and Guardrails

Exposure Controls

The following practices are considerations to help reduce the slip, trip and fall exposure:

- Install continuous handrails on both sides of stairs with the top of the handrail gripping surface mounted between 34 inches and 38 inches above the stair nosing. Install handrails if ramps are more than six feet long, measured at the base.
- Handrail height is measured from the top surface of the handrail to the tread surface at the leading edge of the tread.

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- Maintain a clear space between handrails and walls of at least one and one-half inches.
- Securely and firmly connect handrails for stairways and ramps. The gripping surfaces should be uninterrupted by newel posts or any other obstructions.
- Place guardrails at open sides of stairs, landings, balconies and any platforms that are three feet or more above the floor. These guardrails are to be secured and firmly connected at the correct height.
- Turn guardrail and handrail ends into the wall to prevent catching clothing.
- To prevent entrapment in guardrail openings, design openings to the torso of the smallest user at risk. According to the National Fire Protection Association (NFPA) Life Safety Code®, in areas where children are present, a four-inch diameter ball should not be able to pass through the opening.

Codes and Regulations

NFPA 101 Life Safety Code requires the following stair dimensions for new stairs:

- Minimum clear width of stairs: 44 inches, 36 inches where less than 50 occupants use stairs

Height of risers	4 - 8 inches
Minimum tread depth	9 - 11 inches
Head room	6 foot 8 inches
Maximum height between landings	12 feet

- Treads may have a maximum slope of 1/4-inch per foot in order to shed water. The Life Safety Code requires handrails on each side of new stairs and ramps with a slope of 1:15 or greater. Intermediate handrails are required within 30 inches of all portions of the required stair width. A person can only reach about 24 inches to the side to grasp a handrail.
- The NFPA 101 Life Safety Code requires guards on all surfaces that are 30 inches or more above the floor below to prevent falls over the open side. Such changes in elevation can occur at landings, balconies, corridors, passageways, floor or roof openings, ramps, aisles, porches or mezzanines. The code does not require guards on stairs with handrails on each side.

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- The NFPA 101 Life Safety Code designates ramps as new or existing:

	New	Existing
Minimum width:	44 inches	30 inches
Maximum slope:	1 in 12	1 in 8
Maximum height between landings:	12 feet	12 feet

- Ramps should have a slip-resistant walking surface.
- OSHA allows riser height between 6.5 and 9.5 inches and minimum tread depth for closed risers of 8 inches, 6 inches for open risers.

Sidewalks and Parking Lots

Sidewalks and parking lots are vulnerable to changes in weather conditions and need to be constructed to be slip resistant, even when wet. Snow removal and adequate drainage to prevent rainwater and ice accumulation will decrease the chances of falls occurring on sidewalk and parking lot surfaces. Sufficient lighting is important as sidewalks and parking lots should be well lit at all times. All sidewalks and parking lots should be inspected at least monthly, and any noted deficiencies should be corrected as soon as possible. The following procedures can help you address safety considerations in your sidewalks and parking lots.

Exposure Controls

The following practices are considerations to help reduce the slip, trip and fall exposure:

- Design sidewalk and parking lot surfaces so they will be slip resistant when wet. Do not paint or treat the surfaces in any way that will negatively impact the slip-resistant condition.
- Keep sidewalks and parking lots free of obstructions, holes, drop-offs, cracks and all other depressions and openings. If any of these conditions are present, correct them immediately.
- When sidewalks and parking lots change levels, such as with the use of a ramp, use lighting and high-contrast signage and coloring to indicate the change in level. Paint or outline the ramp in a high-contrast color, such as safety yellow, to bring attention to the level change. The paint should not decrease the slip resistance of the sidewalk or parking lot ramp.
- Wheel stops should be placed where necessary, with adjacent wheel stops at least three feet apart. Paint wheel stops traffic yellow or another high-contrast color.
- Paint speed bumps in parking lots traffic yellow or another high-contrast color.
- Snow removal procedures should be in place in case of inclement weather. Snow should be removed from sidewalks and parking lots as often as required by the authority having jurisdiction, as long as snow falls, and after snowing stops. The frequency of removal should be based on the snowfall amount.
- De-ice sidewalks and parking lots when necessary to control ice buildup.

Snow and Ice

The potential for slips and falls greatly increases when snow and ice accumulate on walking surfaces. The first line of risk control and defense against snow- and ice-related accidents is a well-planned strategy and implementation of a snow and ice removal plan. Having a proactive approach to snow and ice removal rather than a reactive one or none at all can help reduce the hazard of snow- and ice-related accidents and/or injuries.

Exposure Controls

The following practices are considerations for your snow and ice removal plan:

- Develop and implement a written plan. Determine who is responsible for carrying out the plan, contractor selection, maintaining removal logs, frequency of removal, use of sand and/or salt, and proper claim handling practices.

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- Determine if the snow and ice removal will be carried out by in-house personnel or by an outside contractor. Due to the standby nature of snow removal, utilizing an outside contractor may prove the better option. If utilizing outside contractors, they should be selected on their expertise, response times and capabilities. Be sure to verify proper liability insurance coverage. Certificates and contracts should be obtained and reviewed annually, and make sure invoices include details of services rendered.
- Designate someone to monitor weather conditions, walking surfaces and effectiveness of removal practices.
- Record removal activities in a log, such as with the following:

Date	Time	Weather	Action	Initials

- Post warning signs in high-hazard areas, and provide adequate lighting where possible.
- Melting snow adjacent to a walkway or parking lot can result in refreezing of water and new ice accumulation. Reposition downspouts if they discharge water onto walking surfaces.
- Identify and remove, repair or guard objects or conditions that could present hidden hazards under snow or can contribute to the accumulation of ice.
- Remove snow and ice promptly and in accordance with jurisdictional/code considerations. Each municipality has its own ordinances or codes pertaining to snow and ice removal. You should know the municipality requirements where your business or property is located. States and counties may have statutory and/or case laws regarding property care, maintenance and liability. Consulting an attorney and municipal authorities can help provide a better understanding of your obligations.

Contractor Considerations

- Contractors must be selected on their expertise, response times and capabilities. Verification of proper liability insurance coverage is a must, too. An attorney should review the terms of all contracts; they may include hold harmless and indemnification clauses. Certificates of insurance should be obtained and proper limits maintained. There should be a cancellation of liability insurance notice requirement in the contract. Certificates and contracts should be obtained and reviewed annually.

See also [Snow and Ice Removal](#), a Risk Control technical bulletin. Customer logon is required.

References

OSHA General Industry Safety Standards

NFPA 101 Life Safety Code – 2012 edition

ANSI Standard A117.1 Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People: Section 4.8 – Ramps, 4.5 – Ground and Floor Surfaces, and 4.8.5 – Handrails

ANSI/ASSE A1264.2-2012, Provision of Slip Resistance on Walking/Working Surfaces

ASTM – F 1637 – 10 Standard Practice for Safe Walking Surfaces

National Building Codes: International Code Council (ICC) has been adopted in all 50 states. Most U.S. cities, counties and states that adopt codes choose the International Codes, building safety codes developed by the ICC.

ANSI Z535 Family of safety signage standards

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Risk Control Website Tools

Visit “My Work room” on the Risk Control customer website.

- Take the slip, trip and fall program self-assessment under [“My Self-Assessments.”](#) Based on your responses, slip, trip and fall safety gaps will be identified and action items and resources generated to help you in your slip, trip and fall prevention program.
- Under [“My Inspection Checklists.”](#) you can use or customize any of the six slip, trip and fall checklists to inspect your indoor and outdoor premises and address the hazards. Set a baseline and see if you can move the needle in your slip, trip and fall prevention program.



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