Slip and Fall Prevention: Walking Surfaces

Slips and falls can often be hazards in our everyday lives. Many organizations are at high risk simply because of the large volume of people who frequent their facilities daily. When there is a large volume of foot traffic, properly maintaining the walking surfaces is essential in helping to prevent slips and falls.

Sidewalks

Sidewalk maintenance is crucial in preventing slip and fall injuries. Many organizations underestimate how common, severe and costly falls can be, so it's important to become proactive instead of reactive in preventing slips and falls. Regular periodic inspections of sidewalks should be conducted, and any substandard conditions corrected as soon as possible. When doing an inspection, consider the following items.

- Sidewalks should be in good condition and free of cracks or potholes. If cracks in sidewalks are greater than ¼ inch, this can create a trip hazard because it is unexpected. Use a measuring stick, or four pennies stacked on top of each other will equal ¼ inch. If these variances are found, repairs should be made.
- Surfaces should be free from gravel, rocks, and mud.
- Sidewalks that have depressions in the walking surface can trap water and mud, creating slip hazards. These areas should be repaired.
- Items placed in the path of travel, such as trash cans and garden planters, should be removed.
- Landscaping that is planted too close to sidewalks should be kept pruned. If unchecked, the vegetation can overtake the sidewalk, creating trip and fall hazards.
- Tree roots can cause sidewalks to heave and buckle causing serious trip and fall hazards. These areas should be identified and corrected.



This photo illustrates severe trip hazards due to the uneven walking surface. Patching has been completed; however, it is not adequate. In this case, the entire section of the sidewalk should be replaced.

- If construction operations create an alternate route, these walking surfaces should not create additional trip and fall hazards. Also, pedestrians should not be allowed to walk through areas under construction.
- Inadequate patching to sidewalks can create trip and fall hazards from raised/lowered edges, depressions and changes to the surface texture. These areas also should be closely watched.



This photo illustrates severe trip hazards due to the uneven walking surface caused by the tree roots. In this case, the tree should be removed and the damaged section of the sidewalk should be replaced.

Parking Lots and Driveways

Due to the large number of people attending various church-related functions, churches will often have large parking lots to handle the influx of people. However, over time, parking lots can become a real liability hazard for slips and falls if items in the parking lot like potholes, speed bumps, and curbs are not properly maintained.

Regular periodic inspections of parking lots should be conducted and any substandard conditions corrected as soon as possible. When doing an inspection, consider the following items.

- Parking lot surfaces are similar to sidewalks and should be in good condition and free of cracks or potholes. Also, snowplows can cause damage. The ¼ inch variance in walking surface should be followed here as well.
- Surfaces should be free from debris and slippery material, such as rocks, mud and sand.
- Tire stops are a potential tripping hazard. These require maintenance and are exposed to damage from snowplows and vehicles. If tire stops are present, follow these guidelines:
    - They should not be taller than 6.5 inches and there should be at least three feet between wheel stops.
    - Tire stops should not extend beyond the width of the wheels.
    - They should be marked with a contrasting color, such as yellow.
    - Reinforcing rods used to anchor the stops should be level with the top of the stop and not extend above the surface.



This photo illustrates a parking lot that has deteriorated creating trip and fall hazards due to the numerous cracks and depressions in the surface. To correct this hazard, the sections of asphalt should be resurfaced.

- Speed bumps used to slow the speed of vehicles also present a tripping hazard. These are

usually constructed of asphalt and will break down quicker from being exposed to the weather and vehicles driving over them. This will compound the slip and fall exposure. If speed bumps are installed, the following guidelines should apply:



This photo illustrates a severe trip hazard due to the exposed rebar from the deteriorated tire stop. If a trip and fall would occur here, the potential for a severe injury is present from the sharp and exposed rebar rods. To correct the hazard, the entire tire stop should be replaced.

- They should NOT be installed next to natural pedestrian walkways (sidewalks, ramps, etc.), exit or entrance areas.
- They should be marked with a contrasting color so as not to blend in with the parking lot surface.
- Make sure that areas around speed bumps are adequately lit so that they do not become a tripping hazard in the dark.
- “Speed Bump” signs should be installed to give warning of their presence.

Curbing



This photo illustrates good marking of the sidewalk and parking lot variances with yellow paint. By taking precautions such as these, the chances of slips and falls are greatly reduced.

- Curbs should be six inches high. If this is not maintained, due to settling or design, this can create an unforeseen trip hazard.
- Curbs leading to entrances and sidewalks should be painted a contrasting color, such as yellow, white, or red.

- Curb cutouts that are installed to provide handicapped access also should be marked with contrasting paint, and grit should be added to the paint to create surface roughness.

Entrances and Exits

Entrance and exit areas should receive special attention for controlling slips and falls. Due to heavy foot traffic at these areas, the floor surface over time becomes smooth and will have less traction. Dirt and water deposits commonly tracked in from the outside will be higher in these areas and make the floor more susceptible to slips and falls.

The following items should be considered when choosing, installing and maintaining any interior flooring:

- Identify areas that show a high level of smoothness and other defects. Changes in surface floor types also should be identified. This is important, as the person would encounter an unexpected condition (rough to smooth), increasing the chances for a fall. Ideally, the floor surfaces should be consistent.
- Doors should open and shut smoothly with appropriate door closing mechanisms so that, upon closing or opening, there is no risk of people being knocked over.
- The doorsill should be flush with the floor. If not, the change in elevation between the two should be no more than ¾ of an inch.
- If there is a threshold installed, the edges should be sloped, have a non-slip surface and be adequately secured to the floor.
- Having umbrella stands available next to entrances will help keep water from dripping off umbrellas onto the floor.



This photo shows an excellent control for minimizing the slip and fall potential in entryways. This is a grate system with a catch basin, which is built into the flooring surface. If this cannot be installed, use floor mats and/or runners.

- With the potential for ice, snow, mud, etc. to be present at entrances, these areas should be designed to minimize the slip and fall potential. The best design consists of a grate system with a catch basin (shown on the right), which is installed at high traffic areas to effectively remove moisture from footwear. If a grate system is not feasible, mats should be installed. The following guidelines should be followed concerning mats:
- Floor mats specifically designed for removal of dust, dirt and moisture at building entrances and other appropriate locations should be used. Examples of other areas that may benefit from mat installation include the following:
    - Food counters and food preparation areas.
    - Ice stations, freezers and coolers.
    - Near machinery and other areas where spills may occur.
- Floor mats should be designed for removal of dust, dirt, and moisture. Carpet remnants, scatter rugs, or cheap mats (vinyl backing, or no backing) should NOT be used.

- The edging should be beveled in order to provide a smooth transition from the floor to the mat.
- The mat should NOT have curled up edges and should be replaced prior to it becoming dog-eared.
- Mats should NOT be stacked on top of each other in use. This increases the potential for tripping due to the uneven edge from the floor.
- To decrease the potential of the mat from sliding, a single larger mat should be used instead of multiple smaller mats. The larger mat is heavier due to its size, which reduces the sliding potential.
- The Carpet and Rug Institute (CRI) recommends selecting mats long enough to take two full steps (6 to 8 feet) before stepping onto other floor surfaces.



This photo shows a poor example of a floor mat. Carpet remnants should never be used in these areas. They are not designed to trap water and dirt, are not slip resistant and they will curl and fray on the edges.

- Mats and runners should receive proper cleaning and maintenance to ensure their integrity. Once the mats become filled with soil and water, they cannot effectively remove these contaminants from entering the building.

Interior Flooring Surfaces

Aesthetics always play a major role in deciding what type of interior flooring should be installed inside the church. A priority for church leaders should be to determine what type of flooring will be aesthetically pleasing but also to provide adequate protection from slips and falls.

Carpet, ceramic tile, vinyl and hardwoods are all appropriate types of interior floor surfaces; however, due to their design characteristics, one may be more appropriate than the others for certain areas of your church.

Flooring also should be correctly installed, as poor installation can contribute to slip and fall hazards, such as a poorly stretched carpet that becomes loose and bunches.

Of course, maintenance always plays a role in preventing slips and falls as over time poorly maintained flooring will deteriorate and become a hazard. Even regularly maintained flooring can become a hazard if the cleaning agent affects the slip resistance of the flooring.

The following items should be considered when choosing, installing and maintaining any interior flooring:

- Every floor surface has a degree of traction or slip resistance. Although not a formal standard, the flooring should have a coefficient of friction (slip resistant rating) of .50 or higher.
- Flooring material should be suitable for the environment. Areas prone to the presence of water (entryways, bathrooms, etc.) should have high slip resistance characteristics.
- Cleaning and waxing of flooring also should be considered. The use of floor waxes should be



This photo shows a difference in flooring surfaces from carpet to wood tile. Potential slip and fall hazards exist due to the different flooring surfaces installed in a common pathway. Ideally, the surfaces should be consistent. Also note the high degree of smoothness to the hardwood flooring, which also could lead to a slip and fall.

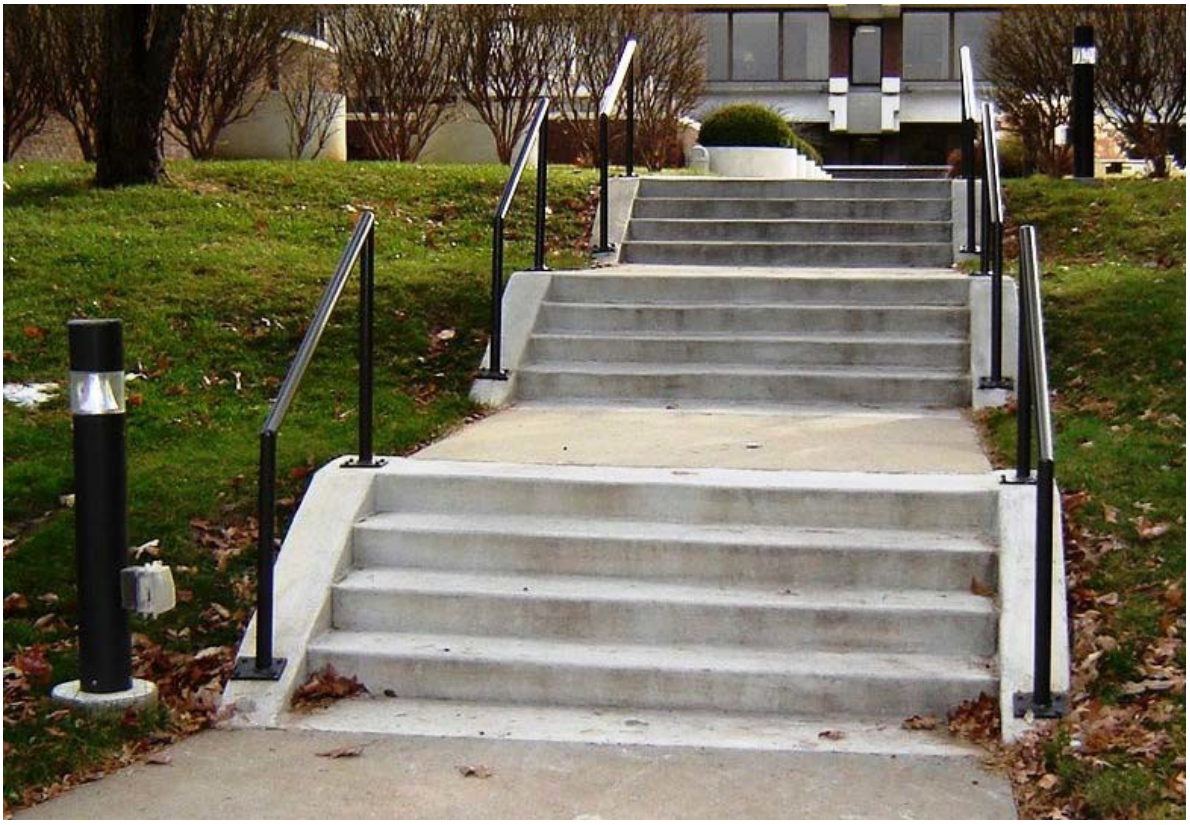
done according to the manufacturers' recommendations and should maintain the slip resistance rating. Non-skid wax should be used on floors. Your cleaning supply company should be contacted for advice. It's also not a good idea to wax floors immediately prior to big events involving a lot of people.

- Dust mops used for floor cleaning should not be treated with oil.
- Flooring should be level and in good condition. If there are any variances in level of more than ¼ inch, this can lead to a trip and fall.
- Carpeting has the best slip resistance rating, but should be kept clean and free from holes, rips and tears.
- Carpeting also should be adequately stretched to prevent it from bunching and becoming a trip hazard.

Lighting

Many organizations have activities seven days a week, many of which run into the late evening hours. Therefore, attendees often find themselves using or leaving the facility during times when there is little or no natural light. Inadequate lighting can be a major contributor to slips and falls, as hazards can be difficult, if not impossible, to see when proper lighting is not provided.

Illumination of interior and exterior walking surfaces should include the following:



This photo shows an example of good exterior lighting for an exterior set of stairs. Lights on this set of stairs are placed at the top and bottom of the stairs to provide adequate illumination.

- Lighting is measured in foot candles. At a minimum, 10 foot candles should be mandatory for all lighting. Higher levels of illumination may be needed in high use areas.
- Lighting should be provided for walkways, parking lots, stairways, hallways and basements. Look for shadows that may be created and adjust lighting accordingly.
- In stairwells, provide a light switch at the top and the bottom of the stairs whenever feasible.
- Inspect all lighting on a daily basis and replace light fixtures or bulbs that do not work.

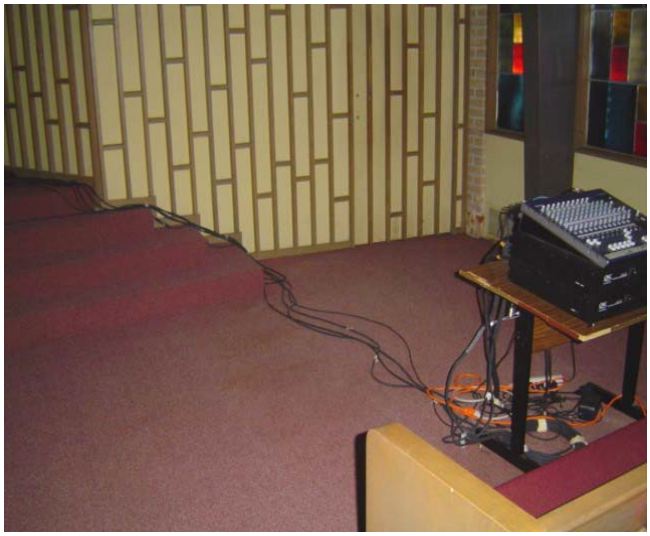
Other Walking Surface Hazards

Oftentimes, facilities may have a miscellaneous slip and fall hazard that may be less obvious than in a more common area, like a set of stairs. However, conducting a thorough inspection of the entire facility and grounds is important, as these miscellaneous hazards are often the areas most likely for a fall to occur, as they are commonly overlooked.

The following items are examples of miscellaneous walking surface hazards that should be looked for when conducting inspections.

- Access covers used to gain access to utilities should be present and flush with the surface.





The photo on the left shows a drainage hole that should have a protective covering installed. The photo on the right shows electrical and audio cables placed on the stairs and walking surface that should be routed away from the walking area, taped to the floor or provided with cord protectors. Areas such as these create unnecessary trip and fall hazards and should be corrected.

- Drain covers that are typically found in parking lots usually have wide openings to provide drainage. This creates a severe trip hazard, especially with high-heeled shoes. Grates should have openings no greater than ½ inch; and they should be painted a contrasting color, such as yellow.
- Electrical, telephone, and microphone cords should be routed around walkways and doorways. Where this is not possible, they should be securely taped down or covered with cord protectors. Whenever possible, use cordless microphones to eliminate excessive cords.
- Elevators should be adjusted so that they are even with the floor surface.
- Holes and depressions formed as a result of settling should be monitored and filled in.
- Old posts, temporary pole supports, etc. should be removed. These only create unnecessary trip and fall hazards.
- Sprinkler heads used for irrigation should be level with the ground surface when not in use.

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