Guide to preventing slips, trips and falls

Workplace Health and Safety Queensland

Queensland **the Smart State**

Queensland Government
Department of **Employment and Industrial Relations**

WorkCover New South Wales

Acknowledgement

Acknowledgement is given to WorkCover New South Wales for the preparation of this publication. Minor amendments have been made to the publication to align it with Queensland legislation and to replace NSW workers' compensation data with Queensland workers' compensation data on slips, trips and falls on the same level.

Further information

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Disclaimer

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What is this guide about?

This guide is aimed at preventing injuries resulting from slips, trips and falls on the same level. All slips, trips and falls on the same level can have serious consequences.

Who needs to be aware?

This guide is for persons who conduct a business or undertaking as employers, self-employed persons or otherwise, principal contractors, persons in control of workplaces (including owners) and designers of a structure or part of a structure to be used as a workplace, as well as workers and other persons at workplaces. The *Workplace Health and Safety Act 1995* (the Act) places obligations on all of these people to ensure the workplace health and safety of themselves and others.

Workplace health and safety officers, representatives, committees and others who have an interest in workplace health and safety will also find this guide useful.

Designers of workplaces should seek additional guidance on relevant technical issues for good workplace design from services, such as Standards Australia, the *Building Code of Australia*, manufacturers and others.

Persons who conduct a business or undertaking

Persons who conduct a business or undertaking, whether as employers or self-employed persons, have obligations which include:

- providing and maintaining a safe and healthy work environment
- providing information, instruction, training and supervision to workers to ensure health and safety.

They are responsible for managing the risks associated with slips, trips and falls on the same level and should consult with workers to identify hazards and implement control measures.

Persons in control of workplaces

Persons in control of workplaces (including owners) have obligations to ensure the risk of injury or illness from a workplace is minimised for persons coming onto the workplace to work and to ensure there is appropriate safe access to and from the workplace for persons other than the person's workers. Persons in control of workplaces need to identify hazards arising from the physical working environment, including the potential for people to slip, trip and fall on the same level.

Workers and others at the workplace

Information, instruction and training are important ways of ensuring workers follow the procedures that have been implemented to ensure workplace health and safety. Workers should report any slip and trip hazards to their supervisor and/or the person responsible for workplace health and safety.

Refer to the *Workplace Health and Safety Act 1995* for further information on the obligations of certain people.

Why use this guide?

The Act and the *Workplace Health and Safety Regulation 1997* require that employers and self-employed persons ensure the health and safety of all people in their workplaces. Persons in control of workplaces (including owners) also have obligations to ensure the health and safety of people accessing those premises. The Act requires workers to cooperate in these efforts. The Act provides

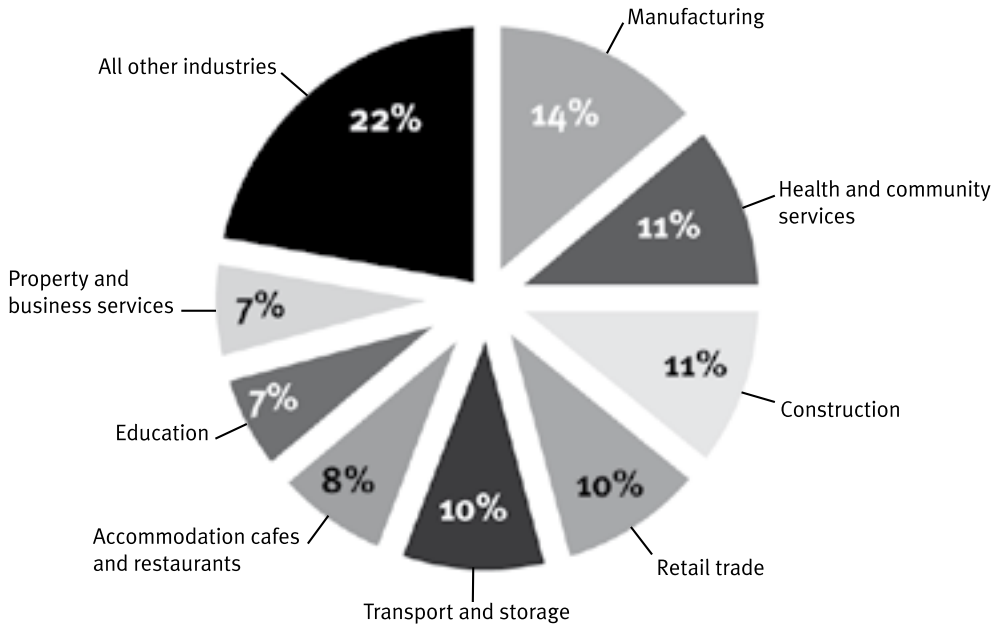
that a contravention of the legislation by a company is taken to be a contravention by each director of the company and each person concerned in the management of the company. Implementing the requirements under the legislation includes due diligence in risk management, which is to identify the hazards and assess, control and monitor the associated risks.

Based on workers' compensation data for 2004-05, total direct costs due to serious claims[1] for slips, trips and falls on the same level in Queensland were $46.3 million. The average cost per claim was $11,100. Queensland workers' compensation statistics for slips, trips and falls on the same level for 2004-05 show that:

- 4180 claims[2] were made for serious injury or illness, which represents 15 per cent of all serious injury and illness claims
- 64 per cent of injuries due to slips, trips and falls on the same level are sprains and strains of joints and adjacent muscles, followed by fractures (19 per cent) and then contusion with intact skin surface and crushing injury excluding those with fracture (8 per cent).

Figure 1 shows that eight industries accounted for most (78 per cent) of the claims for serious injuries due to slips, trips and falls on the same level in Queensland during the period 2002/03 – 2004/05 (Manufacturing, Health and Community Services, Construction, Retail Trade, Transport and Storage, Accommodation, Cafes and Restaurants, Education, and Property and Business Services).

Figure 1: Claims for serious injuries due to slips, trips and falls on the same level - by industry in Queensland for years 2002/03 – 2004/05.



In addition to the compensation costs for slips, trips and falls on the same level (an average of $11,100 per serious claim), there are costs for the employer (increase in workers' compensation premiums, payment of any excess and lost productivity) and financial, physical and emotional costs for the injured worker and their family. A period off work and restrictions on the worker's usual home and leisure activities can have significant effects on their general well being.

1 Permanent impairment claims and temporary impairment claims with a duration of seven calendar days or more absence from work.

2 The injury rate is 2.3 per 1,000 workers covered.

The potential costs of public liability claims should be considered where visitors at the workplace could be injured.

When to use this information

Use this guide to help assess the workplace and to check if important sources of risk have been eliminated or controlled.

This guide should be used when planning, designing or assessing a new workplace, or when making changes to an existing facility. Steps may have already been taken to eliminate slips, trips and falls on the same level in the workplace. It is important to know whether or not the decisions made are still effective. People in the workplace who have responsibilities for health and safety can regularly use this guide to review the risk assessment.

Risk management in the workplace

Risk management is the process of hazard identification, risk assessment and risk elimination or control.

There are many ways in which the workplace design and environment can cause slips, trips and falls on the same level hazards. There is plenty of scope for designing and maintaining the workplace in a way that will eliminate, or at least greatly reduce, the chances of someone having a slip, trip or fall on the same level.

Follow the general risk management procedure, using these steps:

- identify hazards likely to cause slips, trips and falls on the same level by examining the premises and the work
- assess the risks these hazards create by working out how serious the problems are and how often the problems might occur
- decide on control measures to address the risks
- implement the control measures
- monitor and review the effectiveness of the control measures.

This risk management procedure reflects the five step process outlined in Queensland legislation (NSW legislates for a four step process whereby steps three and four are combined). This guide will follow this general approach, and provide guidance on how to deal with hazards relating to slips, trips and falls on the same level. The risk assessment process will give an opportunity to identify other hazards.

Identify workplace hazards

Every workplace needs to be examined so that all slips, trips and falls on the same level hazards are identified. To assist in determining exactly where slips, trips and falls on the same level have happened, or are likely to happen, there are three easy steps to follow.

1. Consult with workers. Employers should consult with workers when going through the steps of this process.
2. Inspect the premises. Checklists may be helpful in identifying the sources of typical hazards. A slips, trips and falls on the same level checklist for a specific workplace can be developed. Start by making a list of the locations of concern. For each location, record anything that could be high risk. Ask workers for their input when preparing the checklist, as they will know about any potential risks from their experience of doing the task. Helpful information will be in records of previous risk assessments. See Appendix 1 for a sample hazard checklist.

Pay particular attention to the following:

- floors and grounds
- housekeeping and cleanliness
- cleaning and maintenance methods
- lighting
- stairs, ramps and sloping surfaces
- walkways
- tasks being undertaken
- footwear.

High-risk areas are:

- where floors can become wet or oily
- where external grounds are slippery or are uneven
- sloping surfaces
- work areas where lifting and carrying tasks (and some other manual tasks, such as pushing and pulling) are performed
- any area where the pace of work causes people to walk quickly or run
- high pedestrian traffic areas
- where there are constant changes to workplace conditions, such as building sites
- unfamiliar locations, such as patient or client homes
- accident locations that have not been secured and cleaned up.

3. Check records including incident and injury reports, near miss reports, workers' compensation claims, and workplace inspection checklists.

Risk assessment

Having identified hazards, the risks arising from them should be assessed. Risk assessment involves determining the likelihood of an incident occurring, and the level of harm that could result. There is not likely to be a single cause for a slip, trip or fall on the same level, and each cause needs to be assessed.

It is important to set a priority for the elimination of hazards. For example, the provision of good slip resistant footwear alone is not sufficient protection against slipping on smooth floors with oil or grease on the floor. The first priority should be to avoid the spills. If this proves to be impractical, suitable slip resistant flooring should be installed. Good footwear is also part of the solution. The most serious risks need to be dealt with first.

The risk assessment should provide detailed evidence about what contributes or could contribute to incidents involving slips, trips or falls on the same level.

Eliminating or controlling risks

Use the risk assessment, in consultation with workers, to determine the best means of eliminating or controlling risks. Document this information and conclusions in a risk control plan (see the example in the Risk assessment and control plan at Appendix 2).

The hierarchy of control

The Act requires that controls or solutions must be applied in a particular way, with the priority being to consider design or engineering controls that eliminate the risk. The following controls must be implemented in the order specified to reduce the risk to the lowest level of risk that is reasonably practicable.

HIERARCHY OF CONTROLS	EXAMPLES
Eliminating the hazard or preventing the risk	Remove slips, trips and falls on the same level hazards at the planning and design stage, or when renovating a facility. Install more power outlets and eliminate split level flooring.
Substituting the hazard creating the risk with a hazard that gives rise to a lesser risk	Resurface floors. Replace substances or equipment currently being used.
Isolating the hazard from the person put at risk	Limit access to high risk areas.
Minimising the risk by engineering means	Apply floor treatments, contain spills, improve lighting and install handrails.
Minimising the risk by applying administrative measures	Adopt safe work practices Provide appropriate training, instruction and information Conduct regular environmental workplace inspections Monitor the tasks undertaken Regularly monitor relevant records, data and statistics Housekeeping and cleaning Signage
Using personal protective equipment.	Wearing appropriate footwear

If a single measure is not sufficient, then a combination of the above measures must be taken to minimise the risk to the lowest level reasonably practicable for that purpose. For example, it is desirable to install the most appropriate slip resistant floor, have staff wear appropriately enclosed footwear with slip resistant soles and use cleaning methods that do not introduce a slip hazard. Take action to prevent fluids spilling on the floor and promptly clean up spills if they happen. If hazards remain after a control is used then additional controls must be applied.

Common control measures

A control measure is something you do to reduce risk. It can be a process, procedure or action that will eliminate or reduce the risk posed by specific hazards.

Control measures for risks identified should be developed and implemented in consultation with workers. During consultation with workers, attention should be given to hazard identification and risk controls in unfamiliar locations (e.g. when workers work off site, or at client's homes or offices).

Workplace design

Making design changes to the workplace can eliminate many slips, trips and falls on the same level hazards.

The ideal way to eliminate the problem of slips, trips and falls on the same level is to design and build workplaces with safety and comfort in mind. When new facilities are to be built, or existing facilities upgraded, it is an opportunity to avoid many common hazards. When designing a workplace, identify potential slips, trips and falls on the same level hazards. In consultation with workers, analyse the tasks to be done by workers and the circumstances in which they will be done. Movement paths of people and materials should be planned and discussed with architects and workers. Providing suitable storage space will help avoid material being placed in work and traffic areas.

Design should consider:

- cords, leads, cables, and powerboards
- lighting
- floor surfaces
- work functions.

Some design controls to reduce hazards include:

- providing power, telephone, computer and other equipment services from ducts in the floor or from the ceiling
- fitting out workplaces to provide flexibility without requiring cords on the floor
- ensuring adequate lighting for work areas, floors, stairs and passageways
- installing floor surfaces suitable for the work area, such as high friction tiles with deep profiles for draining wet areas
- ensuring there is adequate storage space to keep materials out of work and traffic areas.

Flooring

Consider the slip resistance of the floor surface. See Appendix 3 for information about floor surfaces and coverings.

When the flooring itself is identified as a hazard, and installing new flooring is not reasonably practicable, there are a number of floor treatments that are designed to be used on existing flooring. This is a less expensive option than installation of completely new flooring. However, this would be false economy if the treated floor lacks sufficient improvement.

Treatments most likely to be successful are those that substantially increase the surface roughness of the flooring. Be sure a floor treatment doesn't introduce a new hazard.

Minimise changes in the floor level. If levels must change, pedestrian connections are preferably by ramp rather than steps.

Avoid sudden changes in floor surface texture where possible. Where such changes do occur, ensure good lighting and visual cues to the change are in place.

When footwear in the workplace cannot be controlled (e.g. where the public have access) an effective strategy must be put in place (e.g. installing softer flooring, such as thicker vinyl or cork or even carpet). Increasing the roughness of surfaces can increase the slip resistance of floors. For example, concrete finished with a steel trowel is much smoother and therefore more slippery than concrete finished with a wooden float or with a broom. Products that increase the surface friction will need to be maintained in accordance with the manufacturer's specifications.

Stair design

Key points to consider are:

- ensuring the proportions of the stair treads are uniform throughout a flight of stairs
- applying non-slip edges (nosings) to improve safety on stairs and help give visual definition to the edge of the stairs. Metal nosings applied to carpeted stairs should have ample taper to blend smoothly with the carpet. Otherwise, heels can catch in the back edge of the nosing, causing trips
- providing clear visual cues for the start and finish of the stairs, ample lighting above the stairs, and a tread pattern that does not distract from perceiving the edge of each individual step
- providing handrails.

Refer to the *Building Code of Australia* and Australian Standard *AS 1657-1992 Fixed platforms, walkways, stairways and ladders - Design, construction and installation*, for further information.

Ramp design

Install ramps in preference to stairs if there is space to make the change in level without too great a slope.

Ensure the slope of a ramp conforms to the appropriate Australian Standard and *Building Code of Australia* specifications. The maximum ramp slope should be 1 in 8, or 1 in 14 if people with disabilities will need to use the ramp.

Apply flooring of greater slip resistance on ramps than that used on level flooring.

Provide clear visual cues for the start and finish of the ramps, ample lighting above the ramp as well as a suitable tread pattern in the flooring. Provide handrails on ramps, as for stairs and provide kerbs of at least 100 mm high on both sides to prevent trolleys running off the edge.

Lighting

Ensure both internal and external stairways and walkways are well lit. Lighting levels should accommodate changes in conditions, such as transitions from closed to open areas. Refer to the Australian Standard 1680 series on interior and workplace lighting, for further information.

Drainage

Provide a means of containing and draining water or other fluids at machines or processes as required. If there is a substantial amount of fluid, provide channels in the floor covered by gratings. Use gratings as flooring if the work task is very wet and/or greasy. The surfaces should be slip resistant and not introduce a trip hazard with uneven surfaces. Duckboards, for example, may not be suitable because of uneven surfaces.

Flooring that needs to be washed or that will be wet at times, should be graded to drainage points to minimise pooling of water. The location of drains should be as close as possible to any source of liquid and there should be adequate drainage points provided to avoid excessive changes in floor level due to grading.

Use moulded floor tiles with deep profiles for draining fluids. These profiles are most effective if the edges of the patterns are sharp. Special equipment, such as high-pressure water sprays, may be needed for cleaning such tiles. Build up of hardened grease or dirt can make high profile tiles ineffective.

Machinery and equipment

Consider the following:

- carrying out regular maintenance and inspection of production machinery for signs of leaks. Prevent machines spraying out liquids by adjusting or enclosing the machine
- containing liquids on the floor that may have come from production machinery. These can be contained to a small area surrounding the machine by using a metal tray or a low concrete wall. Ensure the containment area is effective, well-drained and does not introduce further hazards
- using absorbent material rolls or flat sheets around the machine. Replace them when they become soaked with fluid
- installing exhaust systems to remove dusts or vapours that can settle onto floors
- supporting electric cords and pneumatic hoses for air tools overhead to keep them off the floor
- ensuring work and traffic areas are clearly defined and marked
- avoiding the use of extension cords where possible by using battery-powered tools
- carrying out regular site clean-ups to remove rubbish
- measures to deal with water from leaking pipes or condensation from air conditioning/refrigeration units in cold rooms. This can be a serious problem because pools of water can freeze on the floor and cause a slip hazard
- when moving materials by hand or by trolleys that are pushed, make sure materials are not stacked so high that the view of the floor ahead is obscured.

Weather

- Stop rainwater, snow and mud being walked indoors on wet days.
- Have absorbent flooring materials set into the floor at entrances.
- Provide leak-proof receptacles at entrances to buildings for leaving wet umbrellas or provide leak-proof plastic bags at entrances for wet umbrellas that are being carried.

Spills

Consider the following:

- ensure the workplace policies and procedures for cleaning up spills clearly identifies who is responsible for isolating and cleaning it up without delay
- ensure that all staff are appropriately trained and instructed in the spills clean-up procedures
- make sure there is easy access to equipment and materials for cleaning up spills. Use absorbent materials for cleaning up spills. The material used should not leave a residue
- substances should be transported and carried in appropriate containers to avoid spills. Use lids or covers where necessary
- if poor packaging causes spills, use alternative containers.

External environments

- A common hazard on external paths is uneven path sections where the edge of one section is above or below the surface of an adjacent section. Uneven pathways provide a typical low trip hazard, which can be difficult to see.
- Laying path sections on a stable base material will prevent them from tilting over time.
- Uneven or sloping ground surfaces can be avoided or levelled to eliminate or reduce risks.
- Good housekeeping is needed where there are constant changes to workplace conditions, such as building sites.

Vegetation

Vegetation, such as moss on external paths, can be slippery particularly in wet and shaded areas. Use commercial products to effectively remove these contaminants. Tree roots, leaf litter and wet grass can present slips, trips and falls on the same level hazards. Good maintenance can reduce these risks.

Housekeeping and cleaning

Cleaning procedures must be reviewed regularly. Good housekeeping involves scanning the workplace for hazards, such as:

- grease build up, spills and low objects
- newly cleaned wet areas where people may walk
- untidy and cluttered work areas.

To ensure that housekeeping and cleaning are performed to an appropriate standard:

- allow sufficient time for staff to carry out these tasks and routines
- implement policies and safe work procedures in consultation with workers
- ensure all relevant workers are trained in appropriate policies and procedures
- clearly define the cleaning tasks, including appropriate sequencing of the work, so that the cleaners themselves are not put at risk by walking unnecessarily over wet surfaces
- ensure cleaning tasks are undertaken at an appropriate time and not during high traffic and busy periods
- use cleaning agents and detergents only according to the manufacturer's directions. Manufacturers of cleaning products should be consulted about suitable materials, equipment and procedures for minimising slipperiness while still doing an effective cleaning job. For the safe use of cleaning products, refer to the manufacturer's information on the product label, the workplace register of hazardous substances, and the Material Safety Data Sheet for the product. Cleaning materials must be compatible with the floor surfaces and provide appropriate slip resistance
- ensure all staff are trained in the safe use of chemicals and substances
- avoid build up of polish and other materials on floors (excess polish may be transferred to footwear and become a hazard elsewhere). It is important to maintain dry conditions where polished floors are used
- perform wet cleaning outside normal working hours wherever possible - otherwise barriers and warning signs should be set up to keep people off the affected areas. Consider providing alternative pedestrian routes if the usual route is being cleaned
- finish wet cleaning processes by vacuuming up solutions or mopping dry, to minimise the time the floor is wet
- remove hardened grease from tiled kitchen floors in order to benefit from any slip resistant texture of the tiles. This may require strong cleaning chemicals that should be thoroughly rinsed off with clean water. High-pressure water sprays may be necessary for cleaning profiled tiles.

Train staff

All workers should have a good understanding of slips, trips and falls on the same level hazards in their workplace. This understanding should be developed through induction and ongoing training sessions. Training should also be discussed as a part of the consultation arrangements in the workplace. Training workers is essential to ensure control measures are maintained and used. All workers play a part in maintaining good housekeeping and cleanliness. Workers must be trained to report any hazards to their supervisor and/or the person responsible for health and safety in the workplace.

Consider the following topics for training:

- how to recognise slips, trips and falls on the same level hazards and the part workers can play in minimising them
- action to be taken in the case of spills. This training should cover procedures to begin cleaning up the spills and immediate action to warn others
- the importance of regular floor surface cleaning and maintaining housekeeping and procedures for preventing slips, trips and falls on the same level hazards. Cleaning staff should be trained on the methods required and control procedures, such as restricting access and using appropriate signage during cleaning to warn of slippery floors
- information on the correct use of cleaning products, which can be found on the product label or from manufacturers' recommendations
- regular cleaning of footwear soles to remove material trapped between the treads.

Signage

- Use warning signs to alert people to surfaces that are wet following recent cleaning or spills.
- Signage should indicate procedures, such as specific footwear required for certain locations. This is important especially for visitors to the workplace.

Footwear

Wear the most appropriate footwear for the job and work environment. Refer to the workplace policy on footwear. Risk assessments should include the use of footwear as a control measure, where this is necessary.

General purpose work footwear should have the following characteristics:

- a slip resistant sole material
- a good tread pattern
- a rounded heel edge with good area of contact (avoid raised heels with small contact area)
- a cushioned sole
- a close but comfortable fit.

Checking that control measures are adequate

Risk assessments and controls must be reviewed regularly or whenever there is evidence that the existing risk assessment is no longer valid.

Review workplace control measures in consultation with workers when:

- an incident involving a slip, trip or fall on the same level occurs (even if it is a near miss)
- changes to the premises or nature of the work are proposed
- new equipment or work practices are introduced.

Make any necessary changes to prevent a recurrence. Consider the following points when reviewing controls:

- Are the cleaning methods for any of the floors and paths fully specified and recorded?
- Are all cleaning staff aware of the required methods and quality standards?
- Are all staff trained in the procedures for dealing with spills?
- Are all workers wearing required personal protective equipment as necessary?
- Have any changes been made to floors, requiring new risks to be assessed?

All managers and supervisors should be aware of their accountability for hazards relating to slips, trips and falls on the same level, including floor quality, cleaning, housekeeping, machinery and equipment, lighting, ramps, stairs, and drainage.

Appendix 1

Sample hazard checklist

Checklist for the prevention of slips, trips and falls on the same level

If any of these hazards are ticked, action needs to be taken.

Floors

- ☐ Can water be walked onto smooth floors (e.g. foyers) on rainy days?
- ☐ Are there any hard, smooth floors in wet or oily areas?
- ☐ Are there any leaks of fluids onto the floor from processes or machines?
- ☐ Is poor drainage causing pooling of fluids?
- ☐ Are there any floor surface transitions not easily noticed (any ridge that is as high as a footwear sole or higher)?
- ☐ Is there any ice or water on cold room floors?
- ☐ Is the floor slippery when wet?
- ☐ Are any anti-slip paint, coating profiles or tapes worn smooth or damaged?
- ☐ Are there any isolated low steps (commonly at doorways)?
- ☐ Are there any trip hazards due to equipment and other objects left on the floor?
- ☐ Are there any raised carpet edges or holes worn in carpets?
- ☐ Are there any tiles becoming unstuck or curling at the edges?
- ☐ Are there any holes or unevenness in the floor surface?

Stairs and ramps

- ☐ Is the lighting insufficient for ramps or steps to be seen clearly and without glare?
- ☐ Do any steps have too small a rise or tread or an excessive nosing?
- ☐ Are any step edges (nosings) slippery or hard to see?
- ☐ Are the steps uneven or are there excessive variations in step dimensions?
- ☐ Are handrails inadequate on stairs?
- ☐ Are ramps too steep, or too slippery?

Lighting

- ☐ Is there insufficient lighting in passageways and at flooring transitions, ramps or stairs?
- ☐ Does the lighting throw distracting shadows or produce excessive glare?

Outdoor areas

Is there a build up of moss or other vegetation on pathways? ☐

Are there any surface transitions not easily noticed (any ridge that is as high as a footwear sole or higher)? ☐

Are there potholes in footpaths or walkways ? ☐

Housekeeping

Is there a build up of polish on floors? ☐

Is there an excessive residue of detergent? ☐

Do workers have to walk on floors wet from washing? ☐

Are wet floor signs not available or not used correctly? ☐

Do you need to provide information/training/advice to contractors regarding cleaning procedures? ☐

Are paper, rubbish, dirt, spills etc. left on the floor? ☐

Are aisles poorly marked and cluttered? ☐

Are any anti-slip paint, coating profiles or tapes worn smooth or damaged?

Are there any trip hazards due to equipment and other movable objects left lying on the ground? ☐

Do spills (wet or dry) occur regularly during work processes? ☐

Tasks

Do workers have to walk or work on greasy, oily or wet floors that are not adequately slip resistant? ☐

Do loads that are carried or pushed interfere with forward vision? ☐

Are the loads to be carried excessive or likely to upset a person's balance? ☐

Do heavy trolleys have to be pushed up ramps? ☐

Are workers hurried due to time constraints? ☐

Footwear

Do the workers' safety shoes lack grip? ☐

Are the tread patterns on safety footwear too worn? ☐

Are the tread patterns clogged with dirt? ☐

Notes

Appendix 2

Example of risk assessment and control plan

HAZARD LOCATION	RISK	ASSESSMENT	CONTROL
Dining area	Slips due to worn floor tiles. Tiles worn badly near door. Slight wear on tiles elsewhere.	High risk from badly worn tiles.	Steam clean tiles to improve friction (short term measure) immediately. Replace tiles around door area (high traffic) with new slip resistant tiles tomorrow.
Kitchen and food preparation	Slippery floor due to grease deposits. Oil splashing onto floor near stoves.	High risk.	Splash guards to be installed immediately. Steam cleaning of floor to improve friction immediately.
Cold room	Smooth concrete floor slippery when wet. Water condensing on floor.	High risk when wet.	Treat with slip resistant coating (epoxy coating or paint containing grit), and supply staff with slip resistant footwear immediately.
Passageways and service areas	Wet vinyl following cleaning has caused slips. Application of wax increased slipperiness, especially when wet. Very slippery surfaces, awkward to walk on.	High risk.	Replace tiles with non-slip flooring immediately. Do not apply wax.

Appendix 3

Floor characteristics

FLOOR TYPE	CHARACTERISTICS
Concrete	Rounded aggregate can be slippery when concrete wears. Interior surface is often sealed to prevent dusting and absorption of liquids - this can increase slipperiness.
Terrazzo	Gives good appearance and wears well but can be slippery when wet, when excess polish used or when dusty.
Quarry tiles, ceramic tiles	Low water absorption and good resistance to chemicals. Slippery in wet conditions if smooth, but can be moulded with aggregate or profiles to improve slip resistance - special cleaning equipment may then be required.
Glazed ceramic tiles	Slippery when wet, particularly with soapy water. Some slip resistance treatments available, but preferable not to install these products on floors.
Vinyl tiles and sheet	Easy to clean. Use sheet form where frequent washing is required to avoid water getting under tiles. Slippery when wet, particularly if polished, however slip resistant vinyls are available. These have aggregates moulded in. Thicker and softer vinyls are more slip resistant than hard ones.
Cork	Must be sealed to prevent absorption of oil and water, but may then be slippery when wet.
Steel plate	Tends to be slippery when wet or oily, particularly when worn.
Rubber	Less effective in wet conditions. Must be fixed down well at the edges and joints or will cause a trip hazard.
Plastic matting	Interlocking PVC extrusions give good drainage and slip resistance. Hose down or steam clean.
Carpet	Carpet has a shorter life than hard floor surfaces, but it can be a cost effective solution. Installations should be wall to wall, to avoid the hazard of a trip on edges. When used in small local areas, such as at entrances, it should be installed in a recess in the floor. Alternatively, it should be rubber backed and with hard wearing tapered edges. Trolleys can be harder to push on carpet, but if larger wheels are fitted and the carpet does not have a deep pile, this is not a serious problem.
Fibreglass gratings	This product can have grit particles moulded into upper surface to provide very good slip resistance. Fluids are quickly drained away.

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