

WHSQ

Workplace Health and Safety Queensland

Guide to preventing slips, trips and falls at work



Contents

About this guide.....	2
1. Slips, trips and falls at work	3
1.1 What are slips, trips and falls?	3
1.2 Factors that influence the risk of slips, trips and falls	4
1.3 Slips, trips and falls risk management.....	6
1.4 Relevant legislation	7
2. Plan for safe access and movement	8
2.1 Provide for safe access and movement	8
2.1.1 Workplace layout.....	9
2.1.2 Floor surfaces	11
2.1.3 Trip hazards	14
2.1.4 Outdoor areas and ground surfaces	15
2.1.5 Stairs and ramps	16
2.1.6 Contain contaminants	17
2.2 Work planning	19
2.2.1 Load handling.....	19
2.2.2 Attentional demands	20
2.2.3 Interaction of other workers	20
2.2.4 Production demands and pay incentives	21
2.2.5 Scheduling and deliveries.....	22
3. Maintain work environment for safe access and movement.....	23
3.1 Keep entry, exit and movement safe.....	23
3.1.1 Maintenance	23
3.1.2 Cleaning	24
3.1.3 Housekeeping.....	25
3.1.4 Weather planning.....	26
3.2 Visibility and detectability.....	28
3.2.1 Lighting, glare and reflections	28
3.2.2 Visual contrast.....	30
3.2.3 Other distractions or restrictions	31
4. Support design and maintenance	32
4.1 Training and supervision	32
4.2 Reporting	33
4.3 Footwear	33
4.4 Individual characteristics of pedestrians	34
5. Consult and work together.....	36
6. Resources	40
A. Case study - Nurse slips and suffers head injury	40
B. Legislation	41
C. References	43
D. Mapping slip, trip and falls (STF) hazards and incidents	43

About this guide

This guide provides valuable information tailored for managers, supervisors, health and safety representatives (HSRs), and others engaged in the prevention of slips, trips, and falls (STF) in the workplace.

Purpose

This guide provides information and examples to understand the common causes of slips, trips and falls (STF) and how to ensure safe movement of workers and others on entry, exit and moving around a workplace. This includes addressing contributory factors that you can see immediately, as well as factors that occur earlier in the task process or aren't as obvious.

This guide provides an overview of:

- how to provide and plan for safe entry, exit and movement
- what is needed for the effective maintenance of the work environment including safe entry, exit and movement
- other actions and considerations that support good planning and maintenance
- how to communicate and work with relevant duty holders
- other resources that provide practical and more detailed advice
- legislation and standards that are relevant to STF.

Scope

This guide addresses specific STF concerns like missteps on stairs or ramps, excluding incidents involving falls from heights, between levels, or from vehicles. It includes both indoor and outdoor environments and workplaces with consistent conditions like hospitals, as well as 'dynamic' workplaces such as construction sites, where environments and tasks are constantly changing.

How to use this guide

If there is a specific incident or situation you need to manage, we suggest you first look at the topic that you consider to be a significant factor (e.g. floor surface) in this guide. Within each section, other relevant factors are mentioned and linked (e.g. [cleaning](#)). You can then jump to another relevant section for more information to help you better understand and manage the risk. As an example of how to apply this guide, please read the case study in the Resources section.

Throughout this guide, and in the [Resources](#) section, you will find helpful case studies, tools and links.

Slips, trips and falls at work



1.1 What are slips, trips and falls?

Slips, trips and falls (STF) can occur when entering, exiting or moving around a workplace (entry and exit are also referred to as access and egress). STF can occur at a worker's usual workplace or another place of work such as a client's worksite.

A fall or loss of balance on the same level is commonly caused by slips, trips or missteps (this is also known as a STF at level). These incidents often result in sudden and/or high acceleration impacts on the body and can result in serious and permanent injuries.



Slips occur when there is not enough traction (i.e. there is insufficient contact, grip or friction between a person's foot or shoe and walking surface, leading to a loss of balance).



Trips occur when a person's foot (or lower leg) gets caught on an object while walking and throws them off balance.



Missteps commonly occur when a person either unexpectedly steps down to a lower surface, for example because they have not seen a bottom step, or when a person steps partially beyond the edge of an unseen change in the walking surface, resulting in a loss of balance.



Other hazards include losing balance near items that are hot (e.g. deep fryer), sharp (e.g. knives), hard (e.g. edge of table), a hazardous substance (e.g. chemicals), at height (e.g. top of stairs) or adjacent to mobile plant (e.g. forklift). These can lead to more serious injuries.



Loss of balance and no fall incidents involve a loss of balance that don't result in a fall to the ground, but can still cause serious injuries. For example, the speed and force of the slip and the subsequent effort to regain balance can result in a significant musculoskeletal back injury.






1.2 Factors that influence the risk of slips, trips and falls

STF incidents usually involve a **combination of multiple and interacting contributing factors** rather than a single cause.

Factors that contribute to the risk of STF can influence directly (e.g. poor lighting) or indirectly (e.g. poor planning resulting in lack of designated walkways). Understanding how these factors potentially interact together and contribute to STF is key to effectively preventing incidents.

This guide describes factors that contribute to STF and how to prevent the risk of STF due to these factors. The below table outlines the factors that can contribute to a STF.

Preventing STF

 PLAN FOR SAFE ACCESS AND MOVEMENT (see Section 2)	
Provide safe access and movement <ul style="list-style-type: none">• Workplace layout• Floor surface• Trip hazards• Outdoor hazards• Stairs and ramps• Contain contaminants	Work planning <ul style="list-style-type: none">• Load handling• Attentional demands• Time pressures/pace of work• Production demands/incentives• Interaction of other workers/activities• Scheduling/deliveries
 MAINTAIN ENVIRONMENT FOR SAFE ACCESS AND MOVEMENT (see Section 3)	
Keep access safe <ul style="list-style-type: none">• Maintenance• Cleaning• Housekeeping• Weather planning	Detectability and visibility of hazard <ul style="list-style-type: none">• Detectability• Lighting• Other distractions
 SUPPORT DESIGN AND MAINTENANCE (see Section 4)	
<ul style="list-style-type: none">• Footwear• Individual characteristics and experience	<ul style="list-style-type: none">• Reporting• Training and supervision

CONSULT AND WORK TOGETHER
(see Section 5)



The information in this guide is grouped under the following main sections:



PLAN FOR SAFE ACCESS AND MOVEMENT

This addresses the factors that can create or influence ongoing STF risks. If there is poor planning and design, risks will be present even if the environment is well maintained. For example, poor scheduling of work can result in material being delivered too early and blocking common walkways, or poor design of drainage can lead to regular and persistent pooling of water in work areas.



MAINTAIN ENVIRONMENT FOR SAFE ACCESS AND MOVEMENT

These factors support good planning and design. They are ongoing through the operation of the workplace. Importantly, they ensure clear and clean accessways, with good visibility of the path of travel and clear highlighting of any hazards along this path. It includes preventing access to unsafe areas and providing alternate safe access.



SUPPORT DESIGN AND MAINTENANCE

This is needed to allow design and maintenance activities to work effectively. These elements alone do not fix the problem.



CONSULT AND WORK TOGETHER

This is required between all duty holders and workers, from the start and ongoing throughout the risk management process. Consultation and working together improves participation and drives a comprehensive understanding of the problem. It also encourages solutions from different perspectives and achieves a greater sense of ownership of controlling STF risks.

Consult, cooperate and coordinate with others who directly or indirectly have control or influence over the business (including those inside and outside of the business), workers and others. External parties that have influence or hold work health and safety obligations include sub-contractors and body corporates. Internal influences can be between business units within an organisation such as operational units and the maintenance unit.



1.3 Slips, trips and falls risk management

Follow the risk management approach to identify all relevant factors which may be obvious and those that are not so evident so that action is taken towards what needs to be addressed and in the most effective way.

Identifying and assessing hazards

Identifying hazards is the first step to determine exactly where, when, and how STF can or have occurred in the workplace. You can find out relevant information by:

- talking to workers and supervisors as they can provide valuable information about STF incidents that have occurred as well as near miss events or potential hazards
- regularly inspecting the premises for STF hazards and assessing the location again when there has been a change e.g. moving onto the next phase of construction or following installation of new flooring. Download the Slips, trips and falls incident worksheet at [WorkSafe.qld.gov.au](https://www.worksafe.qld.gov.au) as an inspection and assessment tool
- sketching or [mapping](#) a layout of the work area and marking on it where STF incidents or hazards have been reported or identified
- reviewing available records such as incident and injury reports, workers' compensation claims, previous inspection reports and STF information from other work units, similar businesses and industry sectors.

Use this information to assess the risk. Prioritise what needs to be addressed by considering:

- the number of people exposed to the risk
- how often the situation occurs
- the consequences of the slip, trip or misstep.

NEED TO KNOW

A **combination of multiple and interacting contributing factors** is usually involved in STF. These risk factors may not be immediately obvious in every case but need to be identified and assessed to effectively control and prevent incidents occurring.

Control the risk

Look at the assessed risks and decide what needs to be done to eliminate or minimise each one.

It is important to think beyond a short-term solution and put in place measures to provide consistent and safe entry, exit and movement around the workplace, including in an emergency.



Tips for implementing the most effective controls include:

- following the hierarchy of control which aims to eliminate the risk or redesign the environment, activity, work process or equipment to effectively reduce the risk
- considering all contributory factors as several controls may be required to effectively reduce the risk caused by the different factors
- actioning short-term measures without delay if the selected long-term control is unable to be put in place quickly
- [consulting](#) workers and other relevant parties such as cleaning contractors about the problem and ways to reduce risks
- allowing workers to trial controls and share their feedback before making a final decision
- supporting the new controls with updated work procedures and [training](#)
- communicating the new controls and work procedures to workers and other relevant parties
- [maintaining](#) these controls to ensure they remains effective, in good order and suitable for the current situation
- routinely reviewing and updating the controls (where required) to ensure ongoing effectiveness.

Monitor and review

Monitor and review the control measures that have been implemented, and if necessary, revise them to ensure they are working as planned. You will also need to check that no new hazards have been introduced.

Review control measures:

- when the control measure is no longer effective
- before a change that is likely to create a new or different risk, such as moving onto the next stage of a project
- if a new hazard is identified
- if consultation indicates a review is necessary
- by regularly inspecting and following up with any new STF hazard and incident reports
- where the control measure did not adequately control the risk, resulting in a similar incident
- if a health and safety representative (HSR) requests a review of the control measure/s as they believe these measure/s have not been adequately reviewed and that it may affect workers.

1.4 Relevant legislation

A person conducting a business or undertaking (PCBU) must manage risks to health and safety by ensuring safe access and movement of workers and others on entry, around the workplace and on exit. A summary of the relevant legislation and who has duties in relation to preventing STF is provided in [Resources](#).

It is not uncommon for more than one person to have a duty (i.e. another PCBU). In this instance both parties are required to conduct consultation, cooperate and coordinate activities together. For example, a property owner and tenant may both have responsibility over a leakage from a refrigeration unit in a warehouse or housekeeping on a construction site are shared between the principal contractor and sub-contractors.

Providing suitable and adequate [training](#) related to STF is also required. More information on what is required is outlined in [Resources](#).

Relevant legislation about providing and maintaining suitable footwear when it is part of a worker's personal protective equipment is included in [Resources](#). Read more about footwear [here](#).

02 Plan for safe access and movement



2.1 Provide for safe access and movement

Good planning is critical when providing safe entry, exit and movement for workers and others at work. This can be achieved when designing access to and around the work site as well as movement in work areas. This applies to the design stage of renovations and refurbishments. [Lighting](#) also needs to be reviewed as part of good design. The principles outlined in this section can also be used when rectifying specific hazards (e.g. poor drainage of rainwater over accessways) and applies to permanent structures and (as far as reasonably practicable) to temporary structures.

Providing for safe movement through the workplace commences from the planning stage and continues through the lifecycle of a project or operational life of the workplace. When done well, planning avoids ongoing problems such as pedestrian and vehicle interaction, blocked accessways and trip hazards. Planning also reduces the amount of effort required to maintain safe walkways and work areas for safe movement. For example, planning for common accessways on construction sites to be made of compacted gravel instead of exposed ground helps reduce the occurrence of potholes and ruts.

Safe movement requires accessways and work areas to be level and free from irregularities, walking surfaces to have enough grip for the expected use and likely contamination, as well as being able to be kept clear and clean.

Additionally, [stairs and ramps](#) need to be consistent in their dimensions and meet required [standards](#). Common examples include flooring that is too slippery for the wet work conditions that workers are expected to walk through, ramps that are too steep, stairways with inadequate handrails, steps with uneven or non-conforming dimensions and/or slippery nosing.

People have expectations of what an accessway is going to be like in a given situation. These expectations guide us to what condition the walking surface is likely to be and helps prepare us as to how we should walk for the situation to reduce STF.

To illustrate this, consider two extremes. First, when walking on rough outdoor tracks, you would anticipate uneven ground, rocks, maybe puddles of water or fallen branches. Compare this with walking in a shopping centre where you would usually assume a smooth and level floor that is kept clean, clear, and dry with sufficient grip.



A **mismatch** between what a person would normally expect of a walking surface and what is in place increases the risk of STF. Examples of mismatch include:

- People expect all steps in a stairway to be the same dimensions. When a single step is not the same as the others it increases the likelihood of a STF.
- People tend to walk to suit the available level of grip of the walking surface and expect this level to remain consistent, unless it is made obvious that there is a change. This provides the opportunity for people to detect the change and adjust how they walk to suit the conditions. There is an increased likelihood of a STF where there is a substantial but undetected change in the level of grip within an area of the same surface. For example, worn and slippery areas of the same kitchen flooring, or between adjacent surfaces that look similar but have substantial differences in the level of grip, such as bathroom and hallway flooring.

[Consulting and working with other relevant parties](#) is part of co-ordinating and ensuring safe entry, exit and movement at work.

2.1.1 Workplace layout

! Issue

Ensuring safe access and movement requires appropriate planning of the workplace layout, site set-up, entry and exit.

Providing safe access and movement includes:

- considering current and future work activities where workers need to have access and be able to move around, what work activities need to be performed, and what material and equipment are required to be moved around the workplace
- starting the design or site set-up stages before any actual work commences at the workplace or site
- monitoring during the lifecycle of the work project and, when there are changes in work stages or work activities.

Double handling and relocation of accessways, structures and equipment can be avoided with good layout planning. For example, the site shed was in a suitable location at the start of the project, but as the project progresses, it blocked an accessway and needed to be relocated. Other associated risks such as traffic management and hazardous manual tasks must also be managed.

✓ Expectations

- Gather information to understand current and future work activities or scheduling at the site or work area. For example:
 - » what is currently in place and what are the anticipated changes
 - » expected type and amount of contamination
 - » who will be walking through the area and what they will be doing while walking as well as any potential impacts such as weather events.



- Identify and assess potential STF hazards arising from the above information. For example, workers and vehicles sharing the same accessways, steep or rocky terrain or a mix of workers and general public using the area.
- Before commencing the project or workspace, plan to allow for safe entry, exit and movement as well as location of [waste areas or bins](#), storage areas and parking or holding areas for plant or equipment. For example, plan where the location of a pad for a tower crane or mobile equipment will be parked.
- Identify the location of walkways on site and designate them, especially commonly used paths. For example, between the car park and entry to work areas, or around work zones.
- Select suitable material to construct walkways that minimise STF hazards. Ensure the material is appropriate for expected conditions such as rain, the type of equipment and plant that will be used on it. It should also be easy to maintain.
- Design, construct and maintain pedestrian accessways and structures to ensure they are within standard design range and are consistent in design (especially within the same building or work area), and free of unexpected obstacles.
- Install clear signage for walkways where possible.
- Minimise people traffic through high-risk areas with separation of accessways for pedestrian and vehicle traffic, rather than shared accessways.
- Aim for:
 - » clear delineation between pedestrian walkways and vehicle/plant access
 - » minimising plant/pedestrian interaction
 - » preventing heavy vehicles/plant ruining accessways (e.g. wheel ruts, potholes) as even minimal impact from plant/vehicles can make areas unsafe for pedestrians
 - » allowing pedestrian only accessways to be constructed in suitable material and vehicle/plant accessways to be constructed in material more appropriate for its use.
- Identify designated delivery areas, storage and lay down areas and waste collection areas (ideally weatherproof).

Additional feature - Storage areas

Issue

Well planned storage means that equipment and supplies don't clutter walkways and helps reduce additional handling of equipment and supplies if access is blocked. For example, stock left in walkways and on stairways when lacking storage space on delivery days, or having to move other equipment to retrieve a wheelchair from the far corner of a crowded storeroom.

Clear access also allows for the use of mechanical aids which minimises manual handling of items. For example, a forklift normally moves material in a lay down area, but the area is now cluttered with other items. This does not allow sufficient space to use the forklift, so workers are required to manually move items out of the way to then access what was originally needed.



✓ Expectations

- Consider what are reasonable storage requirements for expected work activities over the project lifecycle, for high peak times and for changing operational requirements. For example, a greater number of bariatric patients admitted to hospital increases the number and type of bariatric equipment required to be available and requires consideration of equipment dimensions.
- Designate sufficient storage areas for [materials, tools and equipment](#) and adequate space to use mechanical aids or assistive equipment.
- Allocate responsibility and provide supervision so that adequate storage areas are designated and work as intended.

2.1.2 Floor surfaces

! Issue

Safe walking on flooring requires smooth, even and level surfaces with sufficient grip between the floor surface and footwear.

There is a high risk of slipping or tripping when the installed flooring does not suit the combination of expected work activity, possible contaminants and the characteristics of people using the area.

NEED TO KNOW

Key issues to consider when assessing flooring for a potential slip risk:

- Does the flooring provide [adequate grip or friction](#) for safe walking when dry?
- For flooring that is walked on when wet, does it have enough [grip](#) to be safe when wet?
- What are the types and amounts of [expected contaminants](#) likely to be on the floor?
- Is the [cleaning](#) program appropriate for the type of flooring and [expected contamination](#)?
- Is there a risk of falling when walking between areas with different types of flooring material?

Common causes of existing flooring not providing enough grip under normal conditions:

- The surface has become more slippery through wear and tear, damage, contamination, or is at the end of the anticipated life of the flooring. Examples include areas of flooring that are more worn or contaminated than other areas of the same flooring, such as high traffic areas or in front of a deep fryer.
- Flooring that was originally chosen for a different purpose to how the area is now being used, so it may no longer be suitable for its current use.
- Inadequate or poor cleaning. Aside from regular cleaning, a thorough deep clean is often required to restore the flooring back to its initial level of grip. Refer to manufacturers' advice on cleaning for specific flooring or following application of additional floor surface treatments.



Objective measures of floor slipperiness

There are a number of certified methods to assess floor surfaces for slip resistance or grip (as outlined in [relevant Australian Standards](#)).

Slip resistance is the frictional force opposing movement of an object across a surface, usually with reference to the sole or heel of a shoe on a pedestrian surface. Tests indicate the relative slipperiness of surfaces under different conditions, with results reported as the ‘coefficient of friction’. Examples of surfaces with different coefficient of friction include:

- a coarse bitumen surface that has a high coefficient of friction, is advised not to be slippery under general conditions and is likely to be safe for rapid walking
- an icy surface which will have a very low coefficient of friction, is advised to be extremely slippery, requiring extreme caution when walking.

[Resources](#) includes a list of references such as Australian Standards (AS) and the National Construction Code (NCC) which provide requirements and guidance on slip resistance of flooring for specific applications.

Use of slip resistance measurements

Meeting the minimum slip resistance thresholds outlined in the AS and NCC references is important when selecting flooring or surface treatments, as well as regularly monitoring its slip resistance. However, for the slip resistance required for particular flooring to be safe and have a low risk of slipping, it is critically influenced by the interaction of other relevant factors. These include the slope of floor surface, the type and amount of [contamination](#), the [cleaning](#) products (including chemicals) and methods used, [who is walking in the area](#), their footwear, [their activity](#) while walking and environmental conditions.

For example, an external ramp at a hospital was objectively assessed as slip resistant for the application of the relevant standard. However, there was an increased risk of slipping due to the combination of other factors. These included an uneven slope of the surface, regular exposure to rain, frequent pushing of heavy trolleys on the ramp, use of footwear with worn tread and lack of cleaning.

Installing flooring that is recommended for the specific application is only one factor to providing ‘safe’ access and movement at your workplace and by itself is not adequate.

Safe work environments are achieved through the use of a risk management approach that includes **risk assessment of the local situation** (including the slipperiness of the flooring) and **control of all relevant factors**.

Subjective measures of floor slipperiness

Workers, and others that are [reporting](#) areas that are slippery to walk on, can identify specific areas to further assess for slipperiness and other contributory factors. A starting point is to subjectively assess the slipperiness of the floor. This can be used in combination with an assessment of other factors to help inform what the risks are, the level of risk and what needs to be fixed. Objective testing is required for formal or further assessment of the slipperiness of the surface.



✓ Expectations

Suitable flooring

Selecting and correctly installing the most appropriate flooring, using the correct [cleaning](#) methods and keeping flooring well maintained will significantly reduce the risk of STF.

When choosing suitable flooring, consider:

- the expected use or activity conducted in the area
- the expected environmental conditions (including type and amount of contamination, under wet and dry situations)
- who is expected to walk through the area.

Check that the proposed flooring is appropriate for your needs including:

- it meets required slip resistance (seek rating from flooring supplier). See [Resources](#) for more information on guidance for slip resistance rating for different work activities and uses.
- it meets specific flooring requirements such as infection control or food safety
- the cleaning requirement needed for this floor can be met by cleaning staff or contractors
- it is reasonably expected to maintain its condition under normal use and care
- it does not cause other hazards e.g. pushing heavy trolleys on carpet
- that it results in a consistent level and slip resistance (grip) surface especially if different floor surfaces are used.

Treatments to improve grip or slip resistance of flooring

Local areas of flooring may lose their grip over time. These areas of reduced grip may not look any different to the rest of the walking surface. As a result, people can walk on these areas and unexpectedly experience reduced grip on the smoother sections of the flooring. This can be unexpected and suddenly slippery. For local repairs, aim to provide consistent grip underfoot, so that there is similar grip to the surrounding floor.

The options for improving the grip of existing flooring depend on the expected use of the area, the size of the area and the type of existing flooring. These treatments can have different cleaning requirements to the existing flooring. For topical applications, regularly monitor its effectiveness, as these applications may need to be reapplied to maintain its grip. Treatments can reduce the longevity of the flooring and may influence specific flooring requirements. For example, infection control, food safety and hygiene.

For more information on selecting flooring and options for improving slip resistance of existing flooring, please download WorkSafeBC's Preventing slips, trips, and falls in the workplace from worksafebc.com.

Strategies to reduce slip risks in more extreme environmental conditions

Walking and working in more extreme environments such as those with ice (with or without water) or condensation have a higher slip risk. Common examples include working in freezers and cold rooms, using ice and iced products, or moving in areas with high humidity and condensation such as kitchens, indoor pools or laundries.

Ways to reduce this risk include:

- providing appropriate slip-resistant flooring
- preventing or reducing humidity
- maintaining plant and equipment to prevent leaks or spillage such as checking door seals
- removing ice build-ups.



2.1.3 Trip hazards

! Issue

When a trip hazard is in a person's path of travel, their foot or lower leg can catch on it and throw them off balance. There is a greater chance of trips happening if trip hazards are [unexpected](#), can't easily be seen or blend into the background.

Trips are much more likely when there is as little as 1cm change in the height of the flooring or walking surface. For [pedestrians](#) with reduced mobility or balance, this can be even less. Trip hazards, whether indoor or outdoor, can be a fixed hazard such as a bolt protruding from the floor, or a temporary hazard such as pallets blocking accessways.

Indoor trip hazards are commonly caused by:

- poor design or installation e.g. an isolated or single step, fixtures protruding out from floor level such as sliding door frames or inconsistent stair dimensions
- incomplete removal of items e.g. brackets and bolts from equipment that has been moved
- poor maintenance e.g. loose or curling matting, torn carpet, uneven or broken concrete footpaths, chipped/cracked tiles or potholes
- lack of storage so that accessways are used for storage areas
- lack of services e.g. not enough waste bins so waste is left on the ground, not enough power points within range results in trailing cables and cords.

✓ Expectations

Address trip hazards by:

- eliminating potential trip hazards in the [design stage](#) such as site or building planning. For example, recessing or rebating structural trip hazards such as door frames on sliding doors, removal of isolated/single steps.
- removing existing trip hazards. If unable to remove fixed trip hazards or if maintenance can't be carried out immediately, place a barrier around the hazard. Or if there is a low risk, highlight the hazard and provide adequate [lighting](#) so people can easily detect and have the opportunity to avoid it. If the path is blocked, provide an alternate safe and marked out route.
- providing adequate space for safe passage through work areas (e.g. move items out of walkway space) and around work areas so it is adequate for work activities and movement
- ensuring sufficient [storage](#) of all items for workers and others at the workplace to keep items off the floor and out of walkways
- [minimising trailing cables and other items off the floor](#) e.g. installing additional power outlets in areas of use, routing cables overhead and encouraging use of cordless tools
- [providing sufficient waste bins near where waste is generated](#) and emptying bins before waste overflows onto the ground
- conducting regular inspections and encouraging early reporting of hazards
- using a reliable system for regular monitoring and reviewing of STF hazards and incidents, [maintenance](#) and [cleaning program](#).



2.1.4 Outdoor areas and ground surfaces

! Issue

Outdoor areas have the additional issue of being affected by external factors such as rain, mud, wind, vegetation, drainage or watering systems, as well as the impact of vehicles (e.g. causing ruts in accessways). Using or accessing outdoor areas in the darkness or low light levels also increases STF risks.

Common outdoor or ground surface trip hazards include:

- paths such as uneven paving, rough ground or changes in level
- tree roots and vegetation (including seeds) that disrupt walkways
- potholes in designated walkways
- grasses and other plant growth, especially when concealing uneven ground, hollows or holes (e.g. holes that remain after the removal of old fence posts or trees)
- irregular surfaces such as bushy or rocky areas and stone paths
- drains or grate covers that have different surface heights or grip to adjacent area
- uncovered drains
- low lying objects in car park areas (e.g. low car stops)
- tools and equipment such as power leads left in accessways
- exposed watering systems or hoses.

Common outdoor or ground surface slip hazards include:

- contaminants on paths such as wet leaves, mud, moss, sand or gravel
- surfaces that become slippery when wet such as pebbles, tiles, drain covers, certain painted or sealed timber/concrete
- sloping outdoor surfaces which increase the degree of risk compared to a similar type of level outdoor surface (e.g. a sloped lawn compared to a level lawn).

NEED TO KNOW

When pedestrian and vehicle accessways must be shared, consider:

- traffic management that minimises pedestrian, plant or vehicle interaction
- appropriate design of accessways and the material used to construct them, during [planning of the site](#) and for ongoing [maintenance](#). This minimises the impact of vehicle movement on the condition of the accessways, so they continue to be suitable for pedestrians. For example, the impact of deep ruts formed after rain by forklift movement, or the preferred material for a pedestrian walkway may not be appropriate for vehicles and very quickly cause potholes.
- risks caused by the combination of factors such as the slope of a shared accessway in slippery or wet conditions that may result in vehicles colliding with pedestrians.



✓ Expectations

Additional to addressing [trip hazards](#), ways to reduce STF in outdoor areas include:

- providing and maintaining a designated path for commonly used outdoor areas
- improving drainage of areas with pooling of water or muddy areas
- using a non-slip surface treatment on slippery walking surfaces such as drain covers
- installing suitable [lighting](#) in areas accessed outside of daylight hours
- selecting plants and trees which are to be located next to paths that don't drop potential STF hazards such as seeds or sap on paths and don't require hedging of branches (in order to maintain visibility of path)
- regularly trimming trees, hedges and other plants to maintain a clear path, reduce seeds or sap dropping onto the path and reduce overhanging branches that decrease visibility of the path or distract attention for safe walking
- having a [cleaning](#) program in place, to ensure regular cleaning of outdoor paths occurs
- scheduling watering systems to turn on during a time of minimal foot traffic, or if not possible, blocking pedestrian access and providing an alternate path.

2.1.5 Stairs and ramps

! Issue

Walking on stairs and ramps requires extra physical and attentional demands compared to walking on flat surfaces.

People expect to walk on stairs and ramps in a consistent manner and expect to be able to clearly see where they are walking or what they are stepping onto. Performing another task while walking on stairs and ramps, such as carrying a load or pushing a trolley, adds to a worker's physical and attentional [demands](#). Poor or inconsistent design of stairs and ramps increases the likelihood of STF.

Common issues resulting in poor steps or stairs design include:

- stair riser (height) and stair going (depth of tread) measurements that are not consistent or sufficient
- step nosing (leading edge or front of step) that is hard to see, rounded, damaged or slippery
- lack of handrails or handrails that are hard to reach or use.

Common poorly designed ramps include:

- ramps that are too steep
- ramps with no handrails
- lighting that is insufficient to see edges clearly
- no edging or toe boards.

For more information about issues and expectations download Safe design and use of stairs from WorkSafe.qld.gov.au.



✓ Expectations

Good design features are mentioned below with more detailed guidance provided in the relevant Australian Standards which are linked in the [Resources](#) section.

Features of well-designed steps and stairs include:

- Steps have consistent and sufficient depth and height for secure use.
- Step nosing (leading edge or front of steps) is [clear to see](#) and non-slip.
- Handrails are a suitable design and height so they are continuous, with sufficient hand clearance, easy to grip, continue past the steps and are parallel to the ground or floor surface.

Features of well-designed ramps

For ramps that may be used by people with mobility restrictions, [specific design elements](#) are required. Some key features to reduce STF on ramps:

- designed with appropriate slope
- clearly marked start and finish
- fitted with a continuous handrail with sufficient hand clearance and easy to grip
- fitted with toe board or kickboard where required
- suited to the users (e.g. walking unaided, using a wheelchair)
- have surfaces with greater grip than adjacent level areas.

2.1.6 Contain contaminants

! Issue

Whenever there is surface ‘contamination’ (e.g. water, oil, litter, dust, metal shavings, plastic bags, off-cuts or anything else that ends up on a walking surface), the risk of slipping significantly increases.

Contamination can lead to a loss of [sufficient traction or grip](#) between footwear and the walking surface.

Contaminants can be from work processes, cleaning processes, people tracking in contaminants from other areas (e.g. rainwater and mud at building entrances) and from weather events. The greater the viscosity (or thickness) and amount of the contaminants, the higher the risk of slips.

If an area becomes quickly re-contaminated after cleaning, this can indicate that the [cleaning procedure](#) is not adequate for the amount of contamination.

[Planning for the weather](#) is crucial to reduce contamination after a weather event.



✓ Expectations

The most effective approach to eliminating and controlling contamination involves good design to stop it from reaching the walking surface. If this is not possible, contain the spread of contamination on walking surfaces.

If this spread cannot be stopped, clean it up as quickly as possible. Often a combination of these approaches will be more effective in controlling contamination.

Support this approach with regular inspection, [reporting](#), [maintenance](#) and [cleaning](#) systems.

Stop contamination from reaching the floor

After identifying the source of contamination, fix it to prevent it happening again. Ways to do this include:

- minimising rain on common outdoor walkways and entries with a canopy or awning, and integrating building entry mats with adequate capacity for expected rain
- modifying the work process or design of equipment (e.g. channel overflow into drains, install doors leading from areas that generate excessive dust, install sufficient drainage to handle volume and type of waste fluids)
- repairing and maintaining plant and equipment (e.g. fixing a leak)
- providing sufficient waste bins near the source of waste generation and implement a regular [waste collection system](#).

Contain spread of contaminant reaching the floor

Ways to contain the spread include:

- containing the spill (e.g. installing splashguards, providing drip trays under equipment) and having a way to absorb liquids (e.g. placing absorbent matting at building entrances)
- providing effective drainage systems such as installing additional drainage points at the source of contamination (e.g. wash down areas)
- maintaining clean/clear drainage systems
- installing suitable flooring and grates for drainage, to allow safe passage despite the presence of slippery contaminants.

Remove contamination quickly from the floor

This includes planning ahead and putting in place:

- [weather planning](#)
- responsive and effective [cleaning](#) systems.



2.2 Work planning

Good design and planning of work minimises the physical and cognitive (i.e. the thinking and processing) demands of the work required to reduce the risk of people losing their balance when moving around the workplace.

Poor work design and planning can lead to high physical and cognitive demands which can increase the risk of work-related fatigue. For further information on work related fatigue visit [WorkSafe.qld.gov.au](https://www.worksafe.qld.gov.au).

2.2.1 Load handling

! Issue

Undertaking physical tasks such as carrying, pushing or pulling loads while walking increases physical demands and can impact on safe movement around the workplace. Commonly it affects workers when they are:

- unable to clearly see where they are walking (e.g. when handling tall, wide or bulky loads that block vision)
- completing a task that requires carrying (especially with two hands) as this limits normal trunk movements and reactions when balance is challenged
- carrying items that do not allow for a hand free to grasp a rail or break a fall when on stairs or ramps
- pushing or pulling trolleys especially when on slopes, as this requires [greater grip or traction](#) between footwear and walking surface to prevent slips.

The further distance people need to handle loads, the greater the STF risks. This risk is increased when walking on stairs, slopes, ramps or surfaces that are wet, muddy or uneven.

✓ Expectations

Reduce STF risks when workers are required to handle loads while walking by minimising the physical demands and distance involved. Ways to do this include:

- using assistive equipment (e.g. trolley), using an elevator or carrying smaller loads to improve handling of very heavy or bulky loads particularly over a distance, on uneven surfaces or on stairs
- using powered devices to eliminate or minimise force that workers need to exert, reducing the challenge to maintain or regain balance
- reviewing the size, type and configuration of trolley wheels to improve pushing, pulling and manoeuvring loaded trolleys
- minimising transporting or handling of loads outdoors in wet weather, over muddy or uneven surfaces
- minimising pushing loads up inclines
- keeping one hand free when using steps and stairs, to be able to grab the handrail or break a fall if a worker loses their balance
- planning and [scheduling](#) work to reduce the [need for workers to rush](#) as well as reduce fatigue and tiredness.

Where the job design cannot be improved, [providing](#) and [maintaining](#) safe access and work areas requires extra attention.

For more information on how to reduce risks associated with handling loads, please refer to Hazardous manual task Code of Practice which can be found at [Worksafe.qld.gov.au](https://www.worksafe.qld.gov.au).



2.2.2 Attentional demands

! Issue

Attentional demands can distract workers' awareness from safe walking and identifying any potential STF hazards in their path. In addition, these demands can contribute to errors when performing tasks.

Common sources of distraction that can affect a worker whilst walking include:

- environmental distractions (e.g. loud noises, flashing lights or moving in crowded or busy areas)
- visual distractions (e.g. flickering or distracting light, attention-grabbing posters or displays)
- carrying out another activity at the same time as walking (e.g. checking a mobile phone)
- [Poor work design](#) that creates fatigue and inattention due to long shifts with inadequate rest breaks.

✓ Expectations

Ways to reduce attentional demands include:

- minimising carrying out other activities that require significant attention while walking such as checking mobile phones
- minimising visual distractions in locations with high risk of STF (e.g. fix flickering light near ramps, remove attention grabbing displays at the top of stairs)
- minimising expected loud noise in high-risk areas (e.g. by installing door/s to contain noise)
- reviewing fatigue management and work demands.

2.2.3 Interaction of other workers

! Issue

Interactions with others and their work activity such as work areas congested with multiple workers, walking patients or working in a busy restaurant can:

- draw attention away from safe walking
- increase the physical demands required to move around others
- reduce walkway space (e.g. storing material in walkways)
- create additional hazards (e.g. activity of others encroaching into walkway).

✓ Expectations

Ways to minimise STF risks when interacting with others include:

- minimising congestion in the work area (e.g. removing unnecessary furniture or equipment in the work area and scheduling tasks so there are less people in the one work area at the same time)
- using accessways or routes that are well maintained
- planning for adequate space to move around (e.g. walking patients through areas with greater available space)
- clearly communicating expectations when working with others to maintain safe accessways. For example, communicating site expectations and standards such as accessways are to be kept clear of stored material and trailing cords and walkway markers are not to be changed.



2.2.4 Production demands and pay incentives

! Issue

Production demands and pay incentives (such as ‘finish and go’ policies or per piece payment) can increase time pressures on workers to complete their tasks, leading them to increase their pace of work.

These pressures can lead to workers:

- taking short cuts such as using unsafe routes rather than the maintained designated route
- rushing and increasing their speed of movement (walking quickly can increase the risk of losing balance, especially if people experience slight changes that challenge their balance, and not being able to regain their balance)
- carrying, pushing or pulling greater loads than planned to save time, however increasing [physical demands](#)
- reducing their [attention](#), impacting on their ability to detect hazards on their walking path
- experiencing increased work-related stress, which narrows what people focus their attention on (e.g. getting a task done when there is high time pressure) and as a result they are less likely to hear or see things happening in their periphery such as obstacles, and are less likely to process information that seems less important to them.

✓ Expectations

Ways to reduce the risk associated with production demands and pay incentives include:

- checking that the pace of work assigned for the activity allows sufficient time for workers to use safe accessways, walk without compromising their balance as well as the opportunity to detect and avoid any hazards in their path of travel
- organising work to minimise multiple handling and/or use mechanical aids to reduce [physical demands](#) and time. Examples of ways to improve workflow include:
 - » delivering building supplies by truck or crane close to the on-site location where they will be used or next to the external lift, rather than being delivered to the front gate which then requires additional manual handling to move the supplies to the appropriate location
 - » using mechanical aids to deliver materials, tools and items (e.g. roller pallets or wheeled cages)
 - » locating storage areas close to distribution areas
 - » distributing work across the day or week to avoid high peak workloads
 - » using systems that minimise the need for storage and additional handling
 - » supporting improvements with suitable and adequate instruction and training of these measures.
- seeking workers’ input into how work is done and how time is allocated to avoid working at a rate that is at the limit of their ability. [Consult](#) with affected workers and their health and safety representatives (HSR) when establishing a work rate. Examples of how to set realistic work rates include:
 - » allowing workers to control the pace for critical or physically demanding tasks
 - » ensuring the structure of remuneration does not incentivise workers to exceed their capacity to work safely or avoiding taking breaks when required.
- addressing time pressures and tight deadlines, including reviewing the impact of incentives that increase pace and encourage rushing and taking shortcuts.



2.2.5 Scheduling and deliveries

! Issue

Scheduling and coordinating deliveries impacts when, where and how materials or goods are unloaded, stored and handled at the workplace or site.

Factors that impact on scheduling and deliveries can include:

- coordination of multiple parties including different trades or contractors, material or equipment suppliers and transport contractors
- availability of material or equipment to be supplied
- availability of assistive equipment such as trolleys, hoists or cranes
- impact of weather and other delays
- status of work required before next stage can be undertaken.

Difficulties with scheduling deliveries can lead to blocked accessways, [double handling](#), increased distances required to manually handle items and possible damage to material. Loss of time due to this can also increase time [pressures to complete](#) the work.

✓ Expectations

Ways to reduce the impact of difficulties with scheduling and deliveries include:

- reviewing the work schedule including current work and what is required for upcoming work
- [consulting and working together](#) with other operational areas and/or other relevant duty holders. For example, consultation between the principal contractor and sub-contractors on progress and timing of work to:
 - » coordinate work activities (e.g. coordination with suppliers and transport contractors on delivery window)
 - » plan and organise access to assistive equipment to unload and move material around the workplace or site
 - » locate a suitable area for delivery and storage of goods (e.g. lay down area) that is close to area of use, does not interfere with safe access and is accessible for mechanical aids, such as the use of loading bays for construction of multi-level buildings.
- providing an alternate safe access route for the interim if materials block accessways
- staying informed of possible changes such as checking the weather forecast and impact on schedule
- factoring in delays or hold-ups of the work program with alternate plans, including common delays and the possible impact on the other activities or accessways at the workplace. Examples include:
 - » A delayed concrete pour due to formwork problems and the pump not working, resulting in a concrete truck blocking pedestrian accessways. It impacted on other delivery trucks waiting to unload and had to sit behind the concrete truck. To maintain a safe system of work and to keep access open, plan for a parking area just off site and mark this area with traffic cones/barriers and provide traffic control during this delay.
 - » Use hired mobile plant while on site for unloading materials rather than unloading trucks by hand. This may require consultation and planning with other relevant parties.

Maintain work environment for safe access and movement



3.1 Keep entry, exit and movement safe

! Issue

Keeping walking surfaces safe for access throughout the workplace requires a regular, reliable and timely system of maintenance, housekeeping and cleaning.

This also requires planning for the impact of [weather events](#) and actioning the planned measures when these events occur. All of these actions are required to maintain walking surfaces in good condition for safe entry, exit and movement. If unable to promptly address the risk, prevent access and provide a delineated alternate safe route. Or, if the surface condition is low risk, address other contributing factors to minimise the overall risk. This includes improving the [detectability](#) of the hazard, such as highlighting the hazard and providing adequate [lighting](#).

Regular [inspections](#), early [reporting](#), [training and supervision](#), [communicating and working with other relevant parties](#) as well as allocation of responsibility, time, equipment and other resources to carry out this work supports actions to maintain safe entry, exit and movement at work.

Note: The terms housekeeping, cleaning and maintenance are used differently between industry sectors, however the overall intent of this section is the same as defined below.

3.1.1 Maintenance

An effective maintenance program keeps indoor and outdoor walking surfaces, [lighting](#) and highlighting of STF hazards in good condition.

A proactive maintenance program together with a reliable [reporting](#) system, results in a consistent standard to reduce STF risks.

✓ Expectations

Keeping walking surfaces safe for access involves ongoing maintenance of:

- the flooring and other walking surfaces on stairs and ramps, such as:
 - » repairing or replacing the damaged surface. Examples include repairing torn carpet, curling mats, uneven or broken concrete, chipped/cracked tiles.
 - » fixing any changes in heights
 - » maintaining the [slip resistance](#) of flooring with the correct [cleaning](#) methods
 - » improving slip resistance with [surface treatments](#) if required
 - » removing any loose matting.



- equipment and [lighting](#) such as:
 - » repairing or replacing parts of equipment to prevent leaks and spillage
 - » maintaining lighting by replacing bulbs, cleaning light fittings, adjusting for changes in daylight hours throughout the year.
- [outdoor](#) walkways, such as:
 - » maintaining level accessways. Examples include evening out if rutted, adding gravel if muddy, regularly grading unpaved surfaces, removing large rocks and ruts from walkways and working surfaces.
 - » regularly clearing/trimming vegetation over paths.
- highlighting slip and trip hazards, such as:
 - » where floor/surface cannot be fixed immediately or removed, highlighting any height or surface changes with [contrast](#) colours or strips (e.g. yellow anti-slip paint or reflective tape)
 - » maintaining line marking for designated walkways and storage areas.

3.1.2 Cleaning

A suitable cleaning program results in effective removal of [contamination](#) and maintains the grip of [flooring](#). An effective cleaning program also involves preventing unsafe access to areas not yet dry, as well as a system that allocates cleaning responsibilities including who and what they have responsibility for.

As well as undertaking regular or daily cleaning routines, a periodic deep clean is generally required to remove the build-up on flooring that daily cleaning doesn't remove. This build-up can reduce the grip of the flooring.

Expectations

An effective cleaning program involves:

- developing and co-ordinating a floor cleaning system, procedures and schedule for daily cleaning routine, periodic deep cleaning and managing spills (including rapid spills responses)
- using effective ways of keeping pedestrians off floors that are not yet fully dry and safe, such as
 - » using temporary safety barriers to keep pedestrians out of this area (the use of signs alone does not effectively keep pedestrians off the area until it is safe)
 - » providing an alternate safe route, if unable to use the usual route due to cleaning of area
 - » carrying out cleaning in an alternate manner to provide safe access (e.g. cleaning a hallway in strips rather than all at the same time).
- planning and setting up what is required to manage [weather](#) events
- [consulting and working together](#) with relevant parties such as operational business units and cleaning staff or contractors to ensure updates and changes are communicated (e.g. the required cleaning method for new flooring or any reported areas of slipperiness).



A suitable cleaning schedule, procedure and equipment involves:

- using the correct cleaning products (including chemicals) and procedures suitable for the type of flooring and contamination and per the manufacturers' instructions
- using clean and suitable cleaning equipment
- conducting cleaning when there is minimum foot traffic in the area
- using safety barriers to keep pedestrians off areas that are not yet fully dry
- including periodic deep or comprehensive cleaning in the schedule
- putting in place a reliable cleaning system that includes spot or spills response
- providing as appropriate 'spill-kits' and keeping them close to where expected spills occur
- ensuring cleaning procedures for all floors and paths are fully specified, documented and up to date.

Effective communication, [training and supervision](#) involves:

- informing cleaning staff/contractors of the required cleaning products, methods and standards
- [communicating](#) with cleaning staff/contractors on changes of flooring or work activities that may affect cleaning requirements and any [reports](#) of slipperiness
- providing workers with [training](#) in the procedures for dealing with STF hazards including spill or spot cleaning
- [training supervisors](#) so that they can appropriately supervise work practices and ensure expected standards are met.

3.1.3 Housekeeping

Housekeeping in the workplace involves designating and keeping accessways and work areas clean and clear for safe movement.

This includes putting all items away according to a standard and schedule. It also involves [consulting](#) and working with other relevant parties and worker, on the expected housekeeping standards, schedules, roles, responsibilities and inspections.

NEED TO KNOW

Establish and manage an expected standard of housekeeping including:

- setting the expected housekeeping standard and schedule
- allocating responsibilities, roles, time, equipment and other required resources
- [communicating](#) the expected housekeeping standard and responsibilities
- providing alternate safe access if accessways are blocked
- encouraging early [reporting](#) of hazards
- conducting regular [inspections](#) of the workplace to check that the housekeeping standard is met
- providing [supervision](#) to ensure expected standards are being met.



✔ Expectations

- Designate and clearly define (e.g. with anti-slip paint) accessways and walkways, delivery and storage areas, waste management areas and vehicle parking. Maintain these markings.
- Keep accessways clear, which includes maintaining clear and even surfaces for walkways and ensuring equipment, fittings and material are not extending into walkways.
- Put in place an efficient waste management system for each work area and the whole site. This includes:
 - » maintaining designated areas for waste materials or bins
 - » providing enough bins close to where waste is generated
 - » regularly collecting waste before waste overflows onto the ground or into the workspace or walkways.
- Minimising trailing cable and hoses over accessways. For example:
 - » use cordless tools where possible
 - » position power sources closer to area of work
 - » re-route or suspend cables overhead
 - » use wall-mounted storage hooks, shelves or hose spools. Or, if unable to avoid, bundle cord, use retractable holders, recess cable/hosing and its cover flush into floor or secure temporary cables to floor with bevelled protective covers/tape.
- Manage storage of items, including:
 - » providing adequate [storage](#) space
 - » co-ordinating [scheduling](#) and storage of deliveries. For example, co-ordinating timing of deliveries with the time a specific trade will commence and the location of the work area.
 - » tidying up which includes returning items to designated storage areas and removing material accumulated in walkways and on stairs.

3.1.4 Weather planning

! Issue

Weather events are expected and can impact on safe access and movement outdoors as well as indoors (e.g. rain tracked into building). Weather planning allows for a more effective and quicker response to do what is needed.

Planning also ensures that equipment and other resources are available when weather events occur. For example, check weather forecasts for storms predicted overnight, put measures in place before a storm occurs such as putting metal grates or timber planks on walkways that are likely to be muddy, to make them safer to walk on.

Good design and [planning](#) of the workplace and site can [minimise impact](#) (e.g. drainage system in place, canopy over building entries).

[Consulting and working with other relevant parties](#) is important from the planning stage and for managing each weather event.



✓ Expectations

Plan, provide and make available equipment and other resources so that effective measures can be put in place when weather events occur.

Ways to manage safe outdoor accessways for weather events include:

- considering what can be expected with weather events. For example, overnight rain and high winds can result in branches blown over, debris strewn around site or rain puddles.
- planning (for each location and site) what needs to be done when a weather event occurs, so you can ensure safe entry, exit and movement at the workplace/on site. For example, following high winds and rain, conduct a full site inspection, remove debris and dewater main accessways, and check the site is safe before allowing workers back on.
- ensuring resources (people and equipment) are available and equipment is in good order for when needed
- preventing access if not safe and providing a safe alternate route
- [consulting](#) and communicating with other relevant parties to plan for and action what is required to manage these events
- planning for [improvements](#) that allow accessways to continue to be safe after a weather event which reduces need for weather planning. For example, the storm water drain that is too small to adequately cope with a standard rain event resulting in pooled water and mud in accessways, is replaced with a larger capacity drain.

Ways to manage safe indoor access and movement following weather events include:

- [designing](#) to minimise rain entering the building (e.g. installing canopies over building entries)
- containing rainwater and mud entering or being tracked into the building. For example, using entrance matting which has sufficient capacity and size to absorb rain before walking onto hard flooring, using scraper mats to catch mud and dirt before entering the building, providing wet umbrella bags or microfibre dryers at entry.
- directing safe access such as during a heavy rain event, channelling pedestrian traffic from the front door, so people are required to walk on absorbent entry matting to minimise tracking rainwater through the building.

For more information on the risks when removing storm and flood debris, visit [WorkSafe.qld.gov.au](https://www.worksafe.qld.gov.au).



3.2 Visibility and detectability

Good lighting and the ability to detect and recognise potential STF hazards is necessary to avoid these hazards.

Recognising potential STF hazards requires people giving attention to where they are walking and being able to perceive that there is a risk. Reduced [attentional demands](#) to safe walking and certain environments can reduce perception of risk.

NEED TO KNOW

STF risks are greater when they:

- are unexpected. For example, STF hazards located immediately around a corner or a one rise step such as an isolated single step.
- cannot be easily seen e.g. due to poor lighting, shadowing or poor contrasting of hazards.
- are blended into surroundings. For example, holes that are concealed by grass or adjacent walking surfaces that look continuous and level but are different to walk on, like a gutter which is adjacent to a similar looking walking path but has a different height, grip or slope.

3.2.1 Lighting, glare and reflections

! Issue

Poor visibility of where people are walking or the presence of any STF hazards in people's path, greatly reduces the ability to detect and avoid hazardous conditions that may be present.

Common visibility issues are related to:

- low light levels
- dark shadows
- changes in lighting (e.g. moving from brightness to darkness)
- substantial amount of dust or particles in the air
- glare or reflections.

A person's ability to notice hazards is also reduced when there's too much light coming in from a light source (such as uncovered windows) and directly shining into eyes, causing glare. Additionally, glare can occur when excessive light is reflecting off another surface, usually polished or lighter coloured surfaces.

What's expected

Suitable lighting provides an even distribution of adequate light, both within and between areas with minimal glare, shadowing or reflections present. It allows people to clearly see their path of travel and safely undertake work activities. Regular inspection, hazard or fault reporting, [maintenance](#) and cleaning of light fixtures is also required to ensure suitable lighting.

For more information on recommended illumination levels for different areas and activities, download the Managing the work environment and facilities Code of Practice at WorkSafe.qld.gov.au.



Lighting levels

Ways to provide and maintain suitable light levels include:

- providing even lighting levels that are appropriate for the work area and work activities
- providing appropriate outdoor lighting to allow workers to move safely on outdoor paths, around outdoor work areas, and car parks when light levels are low
- adjusting hours of operation of outdoor lighting for seasonal changes and daylight saving
- ensuring emergency lighting is provided for the safe evacuation of people in the event of an emergency
- providing extra lighting at locations of increased risk such as crossing points on traffic routes
- adjusting lighting in transition areas. For example, walking from a bright outside area to an enclosed and darker stairwell. Provide higher lighting levels in the stairwell to minimise the difference in light levels between the two areas, allowing peoples' eyes to accommodate to this change.
- [replacing](#) light bulbs as soon as they start to dim or flicker or implement a program that replaces bulbs before they are expected to stop working
- maintaining light levels by regularly cleaning light fixtures to minimise dust and dirt.

Ways to provide extra lighting include:

- adding or repositioning light fixtures
- painting walls and ceilings white or a light colour that reflects light
- considering installations that bring in natural light (e.g. skylights or windows)
- using sensor lighting for areas where there is intermittent movement or for periods of low light level
- considering wireless, solar or battery lighting options for areas where it is difficult to install electrical lighting.

Glare and reflection

Ways to correct glare and reflection include:

- using window coverings to control incoming light and minimise glare from outside
- replacing large high-intensity light fixtures with several smaller low-intensity fixtures
- installing diffuse light fixtures that spread light over a wider area
- using suitable cover over bare bulbs to control light
- minimising reflective surfaces with matte paint or floor mats.



3.2.2 Visual contrast

! Issue

Visual contrast aids people to visually identify where to step safely and any changes in the path of travel, so people can respond appropriately and in enough time.

Visual contrast is the difference in the lightness or darkness (rather than the difference in colour) that makes objects distinguishable from their backgrounds.

Common examples of where visual contrast is necessary include:

- nosing or front edge of steps
- start and end of ramps
- handrails so that people quickly identify them when needed
- edges of loading docks, dock plate and platforms
- transition areas between different walking surfaces (e.g. adjoining flooring surfaces)
- [trip hazards](#) such as raised door frames, covers on electrical cords, protruding objects on floor or cracks in walkways.

✓ Expectations

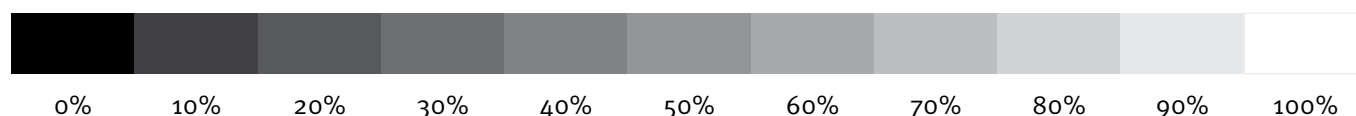
Ways to improve visual contrast include:

- using markings that have strong visual contrast to highlight changes in the walking surface such as nosing of steps and possible trip hazards. The degree of contrast can be measured (see below).
- increasing ambient lighting, especially around entrances
- increasing the visibility of a fluid spill on a floor by cordoning off or using markers at edges of wet areas
- installing floors with high luminance contrast against foreseeable spills or fluids (e.g. porous flooring which darkens when wet or improves visual contrast between flooring and likely fluid contaminants, such as cleaning products).

Good visual contrast between various elements is important to assist pedestrians, including those who are visually impaired, to safely walk around. Visual contrast is about lightness or darkness, rather than the colour, as colours that look different may have little visual contrast.

Use the scale below as a rough check for visual contrast. Look at a black and white photo or image of the examined area to check against this scale. Ideally, the Light Reflectance Value (LRV) between two adjoining surfaces has a difference of at least 30 per cent.

Light Reflectance Value (LRV) Scale



Source: Health and Safety Authority of Ireland and British Standard BS 8493:2008 Light Reflectance Value (LRV) of a Surface – Ways of test.



3.2.3 Other distractions or restrictions

Effect of restricted hearing or noise distractions

! Issue

Good hearing is essential to hear important sounds, like warnings about dangers such as unexpected or poor visibility of approaching people or vehicles, things splashing or falling on the floor, or verbal instructions. The use of music headphones or ear buds reduces the ability to hear potential hazards and work health and safety (WHS) communication. Loud noises in the work area can also be a distraction by taking peoples' attention away from where they are walking and make it difficult to hear WHS communication.

✓ Expectations

- Where the ability to hear clearly is restricted, use other modes of gaining attention such as obvious visual signals.
- Wear hearing protection as needed and avoid using headphones and ear buds (listening to music) in areas where full attention is needed for safe walking and WHS communication.
- Minimise other activities that take [attention](#) away from walking safely.

Effects of restricted vision

! Issue

Working in environments that restrict workers' vision of their path and potential hazards can decrease their ability to detect and respond to changes when moving through these areas. This includes working and moving around workplaces with dark or smoky conditions as well as wearing personal protective equipment such as goggles, face masks or helmets.

✓ Expectations

Provide safe entry, exit and movement with a strong emphasis on accessways that are even, have minimal changes in level and are kept clean and clear. Effective and regular [maintenance, cleaning and housekeeping](#) is needed. Other measures to reduce risk for restricted vision include:

- improving detection of hazards and changes in path through highlighting with greater [visual contrast](#) and suitable [lighting](#)
- minimising tasks such as [carrying loads](#) that further limit vision of walkways and reduce reactions if people lose their balance as well as tasks that require significant [interaction with others](#).

References on providing additional cues to assist people with impaired vision are listed in [Resources](#).

04 Support design and maintenance



Alongside providing and maintaining safe access, additional elements need to be addressed or considered to more effectively manage STF risks. This includes:

- providing suitable and adequate STF related training and supervision
- having an early and reliable reporting process
- following a suitable footwear approach
- considering the characteristics of the individuals who are expected to walk through the area.

4.1 Training and supervision

! Issue

Support the actions taken in providing for and maintaining safe movement on entry, exit and around the workplace with suitable training for workers and supervisors. Provide appropriate supervision to monitor and reinforce expected standards.

✓ Expectations

Train and inform workers and supervisors on:

- the significance and impacts of [STF risks](#)
- [maintaining](#) clear and clean designated accessways. For example, expectations for housekeeping and cleaning, responsibility not to block accessways and how to set up exclusions for movement of heavy vehicles on shared accessways.
- using designated paths (that will be safer than shortcuts)
- selecting, wearing and maintaining suitable [footwear](#)
- needing clear vision and [visibility](#) of path and hazards as well as minimising [distractions](#) when walking
- [cleaning](#) and [housekeeping](#) procedures relevant to their job, the importance of appropriate cleaning procedures and the use of safety equipment (e.g. spill kits, barriers)
- restrictions in place to maintain safe access (e.g. what are the restricted access areas, areas where workers are able to bring in food and drinks).

Consistent supervision is important to support and monitor measures to prevent STF and help assess if they are working. This includes supervision to ensure that:

- [housekeeping](#) responsibilities are followed and standards are maintained
- [accessways](#) are kept clean and clear
- [cleaning](#) procedures are followed and effective
- suitable and maintained [footwear](#) is worn.



4.2 Reporting

! Issue

Early reporting (together with [consultation](#)) is critical as potential hazards are identified and addressed, to prevent more serious incidents from occurring.

✓ Expectations

Inform workers of the:

- importance of early reporting of hazards that can contribute to STF incidents
- importance of reporting STF related to:
 - » near misses and incidents
 - » hazards including:
 - [maintenance](#) issues e.g. damaged or otherwise hazardous walkways, equipment defects, poor [lighting](#)
 - spills or unusual [contamination](#) e.g. overflow or pooling of water
 - [slippery areas](#)
 - [trip hazards](#)
 - damaged or worn [footwear](#) (when provided as personal protective equipment).
- process to report (when and how).

4.3 Footwear

! Issue

Wearing footwear that is fit for purpose (specifically for the work activity and expected contaminants) and are comfortable and secure reduces a person's chance of slipping.

Footwear by itself is not enough to reduce STF. Suitable footwear supports the use of providing and maintaining safe entry, exit and movement to reduce the risk of STF.

Wearing suitable and clean footwear provides better traction with the walking surface.

Suitable footwear involves:

- selecting footwear suitable for workers and their work activities, environment and conditions
- maintaining footwear regularly to keep it in good condition (such as having clean treads, minimal worn areas of tread and good tread depth) so it continues to provide as much traction as possible
- repairing or replacing footwear when it is no longer in good condition to provide effective traction.

Other features of footwear such as a reinforced toe and chemical resistance are outside the scope of this information.



✓ Expectations

Select footwear that is suitable for the required work activities and work environment, as well as suiting the worker's individual requirements for fit and comfort. Maintain footwear to ensure it continues to provide effective grip or traction with the walking surface.

Ways to do this include:

- providing guidance for what is suitable footwear so that it is fit for purpose (considering the work activity and expected contaminants), is reasonably comfortable and fits securely. Footwear needs to be specific for the job and role. Suitable tread for working outdoors with loose gravel underfoot, is different to working in an environment with mostly wet hard floors.
- providing cleaning stations or equipment to remove the contaminants from the tread, so it continues to provide effective traction when walking
- checking that the footwear is suitable
- [reporting](#), monitoring and replacing or repairing when tread is worn out or footwear is in poor condition.

NEED TO KNOW

Signs that footwear is suitable:

- when used in usual work conditions, footwear should feel secure (not slippery underfoot) and treads should not clog up easily during work shifts
- workers find it comfortable (correct size and fit) and secure (firm fitting, well fastened around the foot and not loose fitting).

4.4 Individual characteristics of pedestrians

! Issue

In managing STF, consider who will be walking through the area, such as workers or the general public and their characteristics such as:

- factors that can influence their ability to safely walk through the area (e.g. their mobility, balance or vision)
- footwear they may be wearing
- activities they may be also doing at the same time as walking
- their level of knowledge, experience or familiarity with the work task and work area (e.g. new workers who are unaware that certain areas may become slippery after rain).



Some people may have difficulty to see or notice slip or trip hazards and/or may not have the agility, speed or strength to regain their balance after a small slip or trip. The people at most risk of slips and trips include those who:

- have reduced mobility, strength and/or balance
- have reduced visual ability, impaired hearing or reduced cognitive ability
- are unwell or affected by medication, drugs or alcohol
- are [fatigued](#) or tired (such as that experienced in shift work) which can reduce concentration and attention
- are handling [loads](#) such as bags and boxes
- have competing visual or [cognitive demands](#) (e.g. walking patients, looking after children)
- are [distracted](#) (e.g. by looking at their mobile phone while walking)
- are unable to look at the floor/ground surface while they are walking.

Expectations

For areas that will be accessed by the general public or people with a high risk of STF, there is a greater need to provide safe entry, exit and movement.

There should be a strong emphasis on accessways that are even, with minimal changes in level and kept clean and clear. Effective and regular [maintenance, cleaning and housekeeping](#) is needed. Additional measures to make areas safer for those at higher risk of STF include:

- improving detection of hazards and changes in the path through highlighting with greater [visual contrast](#) and suitable [lighting](#)
- removing or minimising [distractions](#)
- minimising [contamination](#). Examples include providing sufficient rubbish bins close to areas of high rubbish generation or common areas such as eating areas, bagging systems for wet umbrellas, lids or bags for takeaway drinks or food, extra paper towels for hand sanitising or washing stations and extra napkins for food services.
- reducing fatigue and tiredness at work.

Consult and work together



Consulting and working together improves understanding of the problem, allows for possible solutions from different perspectives, and ensures a greater sense of ownership of controlling STF risks. There are clear requirements when consulting with workers, and for consulting, cooperating and coordinating activities with other external duty holders who are involved in, or associated with your work (activities, environment, equipment or materials). Consultation is required from the start and continues throughout the risk management process.

Consulting with workers

! Issue

Consulting with workers is a necessary and important part of managing STF risks.

Workers can provide information that you may not be able to gather otherwise. They can help identify STF risks related to their work or workplace and may have practical suggestions or potential solutions to address them.

✓ Expectations

- Consultation with workers must occur:
 - » when identifying STF hazards and assessing [STF risks](#)
 - » when making decisions about ways to eliminate or minimise risks (e.g. what control measure(s) to put in place)
 - » before a change that is likely to create a new or different risk, such as moving onto the next stage of a project
 - » if a new STF hazard is identified.
- Consult with workers who carry out work for the business or undertaking and who are (or are likely to be) directly affected by hazards. If workers are represented by a health and safety representative (HSR), consultation must involve that HSR.
- Ways to consult include focus groups, worker surveys, workplace health and safety committee meetings, consultative committees, or team meetings and/or individual discussions.

For further guidance on how to consult with workers, download the Work health and safety consultation, cooperation, and coordination Code of Practice at [WorkSafe.qld.gov.au](https://www.worksafe.qld.gov.au).



Consulting with other duty holders

! Issue

There are clear [duties](#) of each duty holder as well as between other duty holders to manage the risk of STF. Other duty holders can include sub-contractors, property owners, other tenants, supply chain and customers. There can be multiple [duty holders](#) involved. For example, the principal contractor and sub-contractor both have duties to provide a safe entry into a workplace. Each [duty holder](#) needs to be involved in consultations.

It is an ongoing process between duty holders for the whole time there is an overlap or for the time in which they are involved in the same work and share the same duty.

✓ Expectations

Key elements of consultation and working together include:

- identifying STF risks and who has responsibilities
- consulting, cooperating and coordinating activities between all duty holders, as well as between operational departments to manage STF risks. This can involve:
 - » establishing clear expectations and standards, as well as agreement on responsibilities between parties
 - » having a shared understanding between all duty holders of what risks are associated with the work, which workers are affected and how the risks will be controlled
 - » consulting with workers as an ongoing and important requirement to manage health and safety
 - » communicating expectations, standards and updates to all workers of duty holders.

For further guidance on how to consult with other duty holders, download the Work health and safety consultation, cooperation, and coordination Code of Practice at [WorkSafe.qld.gov.au](https://www.worksafe.qld.gov.au).

NEED TO KNOW

Identifying STF risks and who has responsibilities

Consulting and communicating with all duty holders to seek relevant information is required to manage health and safety risks. This involves:

- identifying who has responsibilities for the planned work and who shares the same duty. For example, a principal contractor and sub-contractor can share duties in maintaining the housekeeping on a construction site and a property owner and tenant can share the duty to maintain driveways and walkways.
- identifying the impact of each party on the workplace risks that affect workers and others due to the work carried out. For example, consider how the activity of each trade could impact on the safe access or movement of workers during site preparation or during the finishing trades stage.
- identifying who has control or influence over aspects of the work or the environment
- identifying what each duty holder will be providing for health and safety
- identifying what information, training and supervision must be provided to workers for the activity and how it will be provided.

This will determine which health and safety duties are shared and what each person is responsible for.



External parties (that impact on STF risks)

There are many other parties who interact with the workplace and can directly influence STF risks, including the following:

- Project managers/principal contractors who are often involved and have oversight of projects.
- Sub-contractors' whose activities can create STF hazards. For example, truck washing sub-contractor floods access areas.
- Property owners who are often responsible for fittings, fixtures and plant at the workplace (checking lease agreements can help clarify responsibilities). For example, flooring, cold room or refrigeration.
- Other tenants that may create hazards. For example, refrigeration units leaking into a common area.
- Body corporates who are generally responsible for common areas. For example, lighting, cleaning, visitor parking.
- Designers and specifiers involved in specifying flooring or designing out trip hazards.
- Manufacturers, suppliers and installers can also be involved. For example, flooring that meets stated slip resistance criteria, products/equipment that do not contaminate.
- Supply chain/customers can also contribute to STF. For example, timeframes for work to be completed can increase STF hazards when working at customer site.

Cooperation

Cooperation involves making arrangements that have been agreed with other duty holders and not compromising what they are doing to ensure health and safety. Plus, cooperating regarding health and safety matters raised by other duty holders involves communication and responding to reasonable requests to assist them in meeting their duty.

Coordination

Coordinating activities requires duty holders to work together so each can meet their duty of care effectively without leaving gaps in health and safety protection. It involves planning and organising activities together with the other duty holders. Ways to do this include:

- identifying when and how each control measure is to be implemented and have control measures complement each other. This ensures the measures you each put in place work effectively together to control the risks.
- coordinating activities which may include scheduling work activities so each duty holder carries out their work separately, or at the appropriate time. It may require work to be arranged in a way that will allow for necessary precautions to be in place or pre-conditions met before particular work is done.
- consulting again with duty holders if work is not being coordinated effectively.

Written agreements

Written arrangements are not essential but they can help to provide a clear understanding and agreement of expectations to work together to manage STF. Consider including your written agreements:

- A requirement for other parties to consult, cooperate and coordinate on safety matters. This will make the other party aware of this and provide arrangements to follow this up.
- Expectations and standards when working together.



Written arrangements that state who is, and what they are responsible for, can include:

- clean and maintain your own work area which is to be a clean site during and after completion of work, and what the outcomes are if standards are not met
- inform all relevant parties of the standard site rules and housekeeping responsibilities
- the sub-contractor must maintain accessway around their work area (e.g. exclusion zone around trenching area and restore safe access)
- reporting and communication between the principal contractor and sub-contractor (e.g. planning and timing for upcoming work)
- how to resolve issues between relevant parties
- what are shared duties (e.g. the sub-contractor is to maintain own work area and the principal contractor is to oversee the whole site)
- obligations of relevant parties and workers to maintain safe entry, exit and movement on site (e.g. not to change accessways or markings)
- regularly communicate to workers updates and changes to entry, exit or safe movement around the site



A. Case study - Nurse slips and suffers head injury

This case study shows how this guide can be used to identify:

- factors that can contribute to this injury
- what to do to prevent this occurring again.

Incident summary:

Cleaning was routinely completed in a medical ward during patient rest periods between 11am- 2pm. This is also a busy time for medical staff to provide care to patients at their bedside.

During a rest period, the floor immediately around the patient's cubicle was mopped while the nurse was attending to the patient behind the closed curtains.

The nurse, who was carrying several items needed for the task at hand, came out from behind the curtains and slipped on the wet floor. They knocked their head against the end of the bed and sustained a head injury.

Issues to consider:

- Did the [floor surface](#) have appropriate grip (or slip resistance) for the work environment?
- Was the [cleaning](#) schedule crosschecked against other scheduled activities?
- [Cleaning](#) procedure:
 - » Was it suitable for the situation?
 - » Did it prevent the worker and others from walking on this flooring while wet?
 - » Was safe alternate access provided for the worker until the cleaned floor was ready to walk?
- Were there [attentional demand](#) factors that reduced detectability of hazards or diverted the worker's attention when walking?
- Was the worker's [footwear](#) suitable and in good condition for the work activity?

Expectations on how to prevent this happening again

- Check [floor surface](#) has sufficient and appropriate grip (or slip resistance) for expected activity.
- Schedule [cleaning](#) during periods of minimal pedestrian movement in area.
- Review [cleaning](#) procedure and planning to:
 - » keep pedestrians off floor surfaces until completely dry
 - » provide alternative safe access
 - » use appropriate cleaning products (including chemicals), equipment and practices.
- Put in place a suitable [footwear](#) policy and schedule regular inspection of footwear tread.



B. Legislation

Relevant WHS legislation to ensure safe entry, exit and movement around the workplace includes:

Work Health and Safety Act and Regulation 2011

Duty holder	Legislation	Duty or brief intent of the legislation
Person conducting a business or undertaking (PCBU)	WHS Act s.19	Primary duty of care to ensure the health and safety of workers and others
PCBU with management or control of a workplace	WHS Act s.20	Ensure that the means of entering and exiting the workplace are without risk to health and safety of any person
PCBU with management or control of fixtures, fittings or plant at a workplace	WHS Act s.21	Management or control of fixtures, fitting or plant at workplace
PCBU who designs, imports, supplies or installs	WHS Act s.22-26	Duties of designers, importers, suppliers, and installers (Including that the structure is designed as a workplace to be without risks to health and safety of persons)
Officers of PCBU	WHS Act s.27	Duties of officers
Workers	WHS Act s.28	To take reasonable care of own health and safety and not adversely affect the health and safety of other persons
Other persons at the workplace	WHS Act s.29	To take reasonable care of own health and safety and not adversely affect the health and safety of other persons
Each PCBU with a duty	WHS Act s.16	More than one person can have a duty for the same matter
Each PCBU with a duty	WHS Act s.46	Duty to consult, co-operate and co-ordinate activities with other duty holders
Each PCBU with a duty	WHS Act s.47-49	Duty to consult, the nature of consultation and when consultation is required.
PCBU	WHS Regulation s.40	(a) the layout of the workplace allows, and is maintained, for persons to enter and exit and to move about without risk to health and safety, both under normal working conditions and in an emergency (b) work areas have space for work to be carried out without risk to health and safety (c) floors and other surfaces are designed, installed and maintained to allow work to be carried out without risk to health and safety (d) lighting enables— (i) each worker to carry out work without risk to health and safety; and (ii) persons to move within the workplace without risk to health and safety



Duty holder	Legislation	Duty or brief intent of the legislation
	WHS Act s19 with WHS Regulation s.39	Provide suitable and adequate information, training and supervision
PCBU	WHS Regulation s.44	Provide to workers suitable personal protective equipment (footwear) that is maintained in good working order
PCBU – commissioning construction work	WHS Regulations s.294	Person who commissions work must consult with designer
Designer	WHS Regulations s.295	Designer must give safety report to person who commissions design
Principal Contractor for a construction project	WHS Regulations s.314	Must put in place arrangements to ensure compliance at the workplace with requirements for: <ul style="list-style-type: none">the layout of the workplace allows, and is maintained, for persons to enter and exit and to move about without risk to health and safety, both under normal working conditions and in an emergencypersonal protective equipment
Principal Contractor for a construction project	WHS Regulations s.315	Manage risks to health and safety associated with the: <ul style="list-style-type: none">storage, movement and disposal of construction materials and waste at the workplacestorage at the workplace of plant that is not in use.

Codes of practices

- Consultation, communication and co-operation Code of Practice
- How to manage health and safety risks Code of Practice
- Managing the risk of falls at workplaces Code of Practice
- Managing the work environment and facilities Code of Practice
- Safe design of structures Code of Practice

Download the codes of practice at [WorkSafe.qld.gov.au](https://www.worksafe.qld.gov.au).



C. References

Standards, handbooks and industry codes

- *AS 1428 series, Design for access and mobility*. This standard includes specifications for design of ramps for greater accessibility (AS 1428.1) and design of people with impaired vision (AS 1428.4).
- *AS 1657: 2013 Fixed platforms, walkways, stairways and ladders – design construction and installation*. This standard includes specifications for design of stairs and walkways.
- *AS/NZS 1680 Series Interior and workplace lighting*. This standard includes recommendations for lighting levels for different areas of use.
- *AS/NZS 2210.1: 2010 Occupational protective Footwear – Part 1: guide to selection, care and use* and Appendix A - Selection guide based on the slip resistance characteristics of the soles of footwear.
- *AS/NZS 4586, 2013, Slip resistance classification of new pedestrian surface materials*. This standard provides standardised methods of testing the slip resistance of new pedestrian surfaces.
- *AS/NZS 4663, 2013, Slip resistant measurement of existing pedestrian surfaces*. This standard provides standardised methods of testing the slip resistance of existing in situ pedestrian surface materials.
- *Standards Australia Handbook HB 197, 1999, An introductory guide to the slip resistance of pedestrian surface materials*. This guide provides background information on slip resistance and measuring resistance.
- *Standards Australia Handbook HB 198, 2014, Guide to the specification and testing of slip resistance of pedestrian surfaces*. This guide provides recommendations of the slip resistance required for flooring depending on its use and expected work activity of the area.
- *National Construction Code*. This performance-based code sets the minimum required level for the safety, health, amenity, accessibility and sustainability of certain buildings.

D. Mapping slip, trip and falls (STF) hazards and incidents

Mapping out where workers or others have reported recent STF incidents or potential hazards can identify locations of higher risk and assist to prioritise what to fix.

Steps

1. Draw a simple map of the workplace or specific work area.
2. Mark all of the STF incidents or hazards reported in the last 12 months (or longer) (e.g. X on the map). Gather this information by:
 - » using information from STF incident and hazard reports
 - » talking to workers to identify any STF near misses, hazards, or incidents (in case they have not been reported) and add them to the map.
3. Identify any 'hot spots' or areas of repeated incidents or hazards on the map.
4. Use this information with the STF inspection checklist. Download the Slips, trips and falls incident worksheet at WorkSafe.qld.gov.au to further identify and assess hazard/s.

Source: Health and Safety Executive



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