

UNIVERSAL DESIGN: SLIP RESISTANCE

INTRODUCTION

Slips can occur when a person's foot loses traction with the ground surface due to surface contaminants such as water or grease, poor maintenance, inappropriate footwear or flooring product's finish and innate slip resistance rating. Slips causing a person to lose balance and fall may lead to serious injury and hospitalisation.

STANDARDS

The National Construction Code (NCC) outlines the Deemed-to-Satisfy minimum slip resistance classifications in BCA Table D2.14. These classifications are also set out in SA HB 198 Table 3A. The tables outline classifications for ramps steeper than 1:14, ramps steeper than 1:20 but not steeper than 1:14, treads or landing surfaces, and nosings or landing edge strips under dry and wet surface conditions.

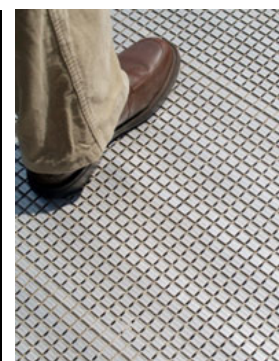
Table 3B in SA HB 198 outlines the slip resistance classifications determined by Australian Standards Committee BD-094 for applications not regulated by the NCC. It is recommended the designer review this information in their due diligence investigation.

AS 1428.1 and AS 4299 require slip-resistant surfaces to be provided to continuous accessible paths of travel (including a path to the entrance of an adaptable housing unit), any circulation spaces, step ramps, kerb ramps, sanitary facilities, kitchen areas and laundries. AS 2890.1 and AS 2890.6 also require slip-resistant surfaces to be provided to pedestrian crossing markings, pavement markings for space delineation, parking spaces for people with disabilities and related walking and wheelchair unloading areas.

APPLICATION OF UNIVERSAL DESIGN

How can universal design be applied to slip resistance?

- Provide an intuitive access path and maintain a clear line of sight, where possible.
- Determine stair riser and going dimensions, and ramp gradients based on ease of use and location in addition to regulatory requirements.
- Avoid sudden changes in height, level and direction.
- Consider designing access paths so that they are not located beneath trees with heavy leaf fall.
- Use a slip-resistant flooring product with greater wear resistance to accommodate users regardless of their ability, condition, pace or footwear.
- Consider the surface treatment and coating used for flooring products. Treatments such as grinding or sanding floor surfaces can be used for existing floors to improve their slip resistance. Consider if aggregate can be used in the case of linemarking in car park areas.
- Provide slip-resistant surfaces in areas where slips are a foreseeable risk, e.g. bathrooms and kitchens.
- Provide entrances with adequate weather protection, e.g. adequate awning depth, entry floor mat, drainage to reduce water pooling.
- Improve lighting levels and/or quality to increase the user's ability to identify potential slip hazards.
- Consider handrails on both sides of internal stairs.



Universal design

Universal design is the design of buildings, products or environments to make them accessible and usable to all people of different ages and abilities over time, without the need for adaptation or specialised design.

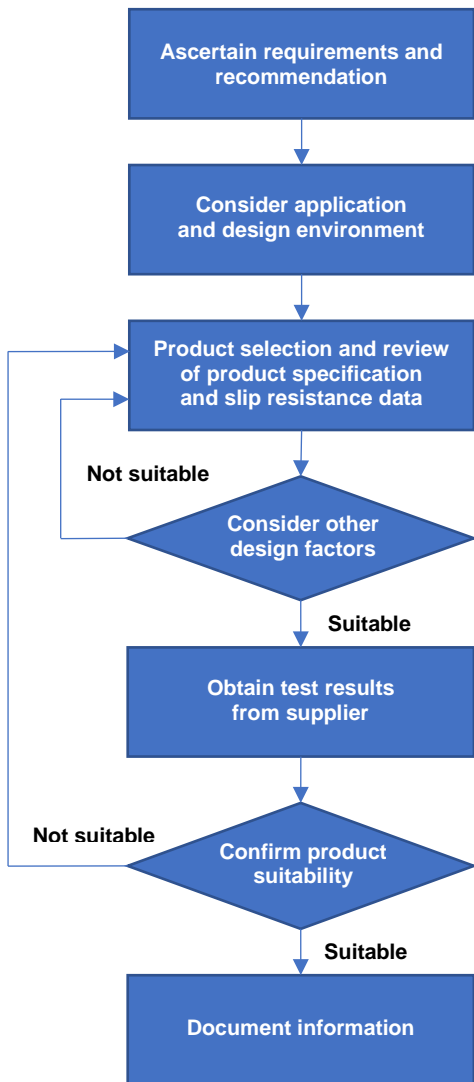
Relevant standards

AS 1428.1 *Design for access and mobility - General requirements for access - New building work.*
 AS 2890.1 *Parking facilities - Off-street parking.*
 AS 2890.6 *Parking facilities - Off-street parking for people with disabilities.*
 AS/NZS 3661.2 *Slip resistance of pedestrian surfaces - Guide to the reduction of slip hazards.*
 AS 4299 *Adaptable housing.*
 AS 4586 *Slip resistance classification of new pedestrian surface materials.*
 AS 4663 *Slip resistance measurement of existing pedestrian surfaces.*
 SA HB 197 *An introductory guide to the slip resistance of pedestrian surface materials.*
 SA HB 198 *Guide to the specification and testing of slip resistance of pedestrian surfaces.*

UNIVERSAL DESIGN: SLIP RESISTANCE

DESIGN PROCESS

What actions should a designer take?



Requirements/Recommendations:

- BCA Table D2.14.
- SA HB 197.
- SA HB 198.
- Universal design. e.g. LHDG performance level.

Considerations may include:

- Building class.
- Wet, dry or transitional area.
- User type and activity.

Selection criteria may include:

- Aesthetic (colour, size, surface finish, texture.)
- Performance.
- Cost.

Considerations may include:

- Lighting and illumination level.
- Colour and luminance contrast.
- Potential wear and maintenance.

Information supplied may include:

- Product data sheet.
- Slip resistance certification from an Accredited Testing Laboratory.
- Accelerated wear test results.

Confirm suitability in relation to:

- Statutory requirements.
- Design brief/client requirements.

Actions following selection:

- Document selection process and compliance information received.
- Consult independent specialist if appropriate.

Relevant websites

Center for Inclusive Design and Environmental Access, University at Buffalo idea.ap.buffalo.edu

Center for Universal Design North Carolina State University projects.ncsu.edu/ncsu/design/cud/

Livable Housing Australia www.livablehousingaustralia.org.au

Relevant documents

Livable Housing Australia, *Livable Housing Design Guidelines* www.livablehousingaustralia.org.au

NATSPEC TECHnote *DES 037 Accessible housing*

NATSPEC TECHnote *DES 038 Universal design: Introduction*

NATSPEC TECHnote *DES 040 Universal design: Trip avoidance*

Relevant worksections

0262 External sports and playground surfacing

0274 Concrete pavement

0275 Paving - mortar and adhesive bed

0276 Paving - sand bed

0277 Pavement ancillaries

0279 Paving - on pedestals

0282 Pathways and cycleways (Construction)

0310 Concrete – combined

0314 Concrete in situ

0315 Concrete finishes

0383 Sheet flooring and decking

0411 Waterproofing – external and tanking

0541 Access floors

0612 Cementitious toppings

0613 Terrazzo in situ

0631 Ceramic tiling

0632 Stone and terrazzo tiling

0651 Resilient finishes

0654 Engineered panel flooring

0655 Timber flooring

0656 Floor sanding and finishing

0657 Resin based seamless flooring

OTHER CONSIDERATIONS

The designer should also consider the following:

- Materials have different characteristics and finishes which may impact their innate slip resistance. Consider their performance over time. A product may adequately comply with the Deemed-to-Satisfy provisions at installation, but the surface may deteriorate with wear and/or lack of maintenance so that it is no longer compliant. Consider specifying a product which has had an accelerated wear test carried out by an Accredited Testing Authority to determine the potential performance of the product over time.
- Shared or public areas are likely to be maintained by a facilities management company. Facilities may not be managed around the clock (in the event of damage, spills, etc). Insufficient lighting or lighting which is replaced infrequently may hinder users from identifying a potential slip hazard.
- Conversely, certain uses may require areas to be frequently cleaned for hygiene reasons and to comply with food and health regulations. Adequate drainage combined with management and clear signage may alleviate potential slip risks.
- Use of slip-resistant products beyond the Deemed-to-Satisfy provisions may be subject to project suitability, cost feasibility and client acceptance. Difficulty in cleaning and higher maintenance costs may be a barrier particularly for residential buildings, and the client may be unwilling to bear additional cost for the benefit of future users.