KEEPING THE PEDESTRIAN UPRIGHT – LIABILITY AND THE ATTENTION TO DETAIL

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ABSTRACT

Having only two legs (and not three) human beings are inherently unstable. The necessity for walking over rough ground compared with rolling over terrain with wheels, creates many self-evident hazards. Local government is faced with the dilemma of providing increasingly higher standards of pedestrian facilities, but in doing so are raising the public's expectation of a hazard free environment. That expectation exists within a framework of an increasingly assertive legal profession, who are continually "raising the bar" of the Standard of Care, with the result that local government is expected to deliver an almost perfect pedestrian environment.

This paper examines the requirements outlined in Australian/New Zealand Standard AS/NZS 3661 as well as Austroads Guidelines, and explores the issues associated with providing a "reasonably" risk free pedestrian environment. The paper discusses the need for attention to detail with pavement and street furniture design, and identifies an increasing necessity for safety audits of pedestrian facilities.

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1) INTRODUCTION

Jamieson Foley and Associates is regularly briefed to conduct investigations into incidents involving pedestrians sustaining injury as a result of either tripping on an object, or slipping on a surface and falling. Since 1989 the firm has conducted about 200 such investigations and is briefed equally by the "Defendant" (typically local government) and the "Plaintiff" (a Solicitor representing a pedestrian).

Based on our experience, many of the incidents investigated might have been avoided during the normal engineering processes. Those processes involve –

- planning,
- design,
- construction and
- maintenance activities.

This paper addresses the issues and implications in relation to planning, design, construction and maintenance of pedestrian facilities in the local government environment. This paper also briefly analyses the ways and means to prevent slip/trip incidents.

2) COSTS OF SLIPS AND TRIPS

As unlikely as it might seem, slip/trip and fall incidents cost the Australian community several billions of dollars each year (Municipal Engineering, 2000). These costs probably exceed motor vehicle accident costs.

Included are direct costs such as:

- Financial loss to the victim,
- Pain and suffering to the victim,
- Compensation payments by the responsible authority (typically local government),
- Litigation costs for all parties.

Indirect costs can include:

- Employer costs from resultant sick leave,
- Employer training costs,
- Lower productivity.

The typical direct cost for a relatively minor fall is about $13,000 (ibid).

3) LOCAL GOVERNMENT EXPOSURE

Local government maintains almost all of the public places such as walkways, malls, footpaths, community halls and parks. The challenge for local government is how to economically identify potential hazards and treat them with their limited funding and resources.

Historically, it was a common engineering reaction to an allegation of a fall to immediately *suspect* the circumstances, or possibly to "blame the victim". This approach results in the legal/insurance world building a case of "Contributory Negligence" against the claimant. This is a legitimate process, but not without cost to the defending authority. Typical contributory negligence assertions involve: alcohol/drug affectation, "skylarking", illegal behavior and so on.

The initial establishment of liability is often not as straightforward as it might seem. The question of who is liable for the incident often goes to:

- Planning and design issues,
- Construction issues,
- Maintenance issues.

4) STANDARDS AND GUIDLEINES

4.1 Trip and Fall

The *"Guide to Traffic Engineering Practice (Part 13) - Pedestrians"* (Austroads, 1995) notes the following:

- *It is important for many people that surfaces be flat. This is particularly so for people in wheel chairs, on crutches or who are unsteady on their feet, as small ridges and protrusions as low as 6mm can cause these people to stumble and fall.*

- *Surface should not deviate more than 5mm from a 500mm long straight-edge laid anywhere on the surface*

To an engineer, the suggestion that a six millimetre level difference is a hazard to pedestrians creates a difficult challenge not only to construction supervision, but also to the monitoring of public facilities and the maintenance of those facilities.

4.2 Slip and Fall

AS/NZS 3661.1-1993 Slip Resistance of Pedestrian Surfaces is the relevant Australian Standard. It is recommended that all engineers (and lawyers) working in local government study this Standard.

The slip resistance of a surface is a function of the friction acting between an object and the surface, when force is applied to the object to initiate or sustain movement. Friction is the resisting force to an object sliding on a surface.

The coefficient of friction (the ratio between the force required to move an object and its weight) is a measure of the slip resistance of a surface for a certain object. Friction is usually independent of the weight of the object, and is determined by the properties of the contact areas between the object and the surface.

When considering the likelihood of an object slipping on a surface, the coefficient of friction must be considered with respect to the magnitude and direction of the force applied to the object. Two values of friction must be considered in determining the likelihood of a slip occurring, these being the *static* coefficient and the *dynamic* coefficient of friction.

The *static* friction between a shoe and a surface is necessary to control walking. During normal controlled walking the coefficient of friction between a shoe and a surface is determined by the *static* friction between the two surfaces. *Static* friction being where there is no relative movement between the shoe and a surface during the walking motion.

If a slip occurs during walking, then the threshold of *static* friction between the shoe and the surface has been overcome by the forces applied to the shoe. Once the *static* friction has been overcome, the shoe will start to slide over the surface. The coefficient of friction which acts during slipping is termed *dynamic* friction. This value is typically lower than the *static* friction between the same surfaces. Therefore, once a slip starts it will continue until the force acting on the shoe is significantly reduced in the direction of slip.

Some surface materials have a significant variation between the *static* and *dynamic* coefficient of friction, particularly if wet or contaminated. These surfaces can hence become unsafe to users.

The coefficient-of-friction ranging between *safe* and *slippery* or *unsafe* walking surfaces are generally as follows:

Safe	0.6 static 0.5 dynamic
Marginal	0.5 static 0.4 dynamic
Hazardous/slippery	0.4 static 0.3 dynamic
Slippery	0.3 static 0.2 dynamic

In general, a dynamic coefficient of friction below 0.4 is considered unsafe, and above 0.5 is considered a safe walking surface. These values are obtained from standard testing of surfaces, using a hard rubber slider. If the sole of a shoe has less slip resistance than the standard rubber slider, a walker will experience a lower level of friction on a given surface.

AS/NZS 3661.1-1993 Slip Resistance of Pedestrian Surfaces specifies that walking surfaces should provide an average coefficient of 0.4 under wet *and* dry conditions

5) ISSUES

5.1 Planning and Design of Pedestrian Facilities

Self evidently, a pedestrian facility should be designed to the relevant Australian Standards and AUSTROADS guidelines. It is common however that the following issues contribute to slip and fall incidents:

- Existing pedestrian facilities not complying with more "recent" Standards.
- Despite intentions, the elements of a new pedestrian facility not complying with the relevant Standards.
- The non-availability of preferred construction elements (e.g. paving types).
- An absence of a pedestrian facility at a warranted location (typically created by changed pedestrian demand).
- Designer error.
- The production of a design which would make it vulnerable to a later problem (e.g. tree root growth).
- Construction error created by design ambiguity.
- Insufficient thought given to pedestrian behavior (poor ergonomics).
- Insufficient thought given to the characteristics of likely users (e.g. elderly/disabled).

Many of these issues are able to be addressed at the <u>design stage</u>, and thus have the potential to be prevented at little cost.

5.2 Construction of Pedestrian Facilities

Although a pedestrian facility may be designed to the required Standards and guidelines, they (clearly) should be <u>constructed</u> to that design and specification. The following issues are often identified in the investigation of slip/trip and fall claims:

- The non-availability of <u>specified</u> construction elements (e.g. paving types).
- The use of <u>non-specified</u> construction elements.
- Poor workmanship.
- Poor supervision.
- Unapproved design changes.

- Work as executed not being in accord with the drawings and specifications.
- Inadequate work-in -progress supervision, sign-posting and/or lighting.

5.3 Maintenance of Pedestrian Facilities

The maintenance of pedestrian facilities is one of major challenges faced by local government, primarily due to resource and budget constraints. The following issues were identified to contribute to slip/trip and fall claims:

- The lack of awareness of a problem.
- The absence of an adequate monitoring/auditing process.
- The time-lag from the notified slip/trip incident to the Council inspection.
- The time-lag from the Council inspection of a trip/slip location to rectification.

6) RECOMMENDED METHODOLOGY – IDENTIFICATION OF HAZARDS

It is considered that the methodology shown in Table 1 would reduce the frequency of trip/slip and falls claims. Several control points are required to identify deficiencies and potential pedestrian safety hazards of the facility.

Table 1 – Suggested Methodology - Summary

Stage	Control Point
Planning of a Pedestrian Facility	Carry out site inspection /surveys to identify pedestrian users and needs
Design of a Pedestrian Facility	Conduct a pedestrian safety audit on the detailed plans based on relevant standards
Construction of the Facility	Conduct a pedestrian safety audit at site during construction and before opening
Maintenance of the Facility	Conduct routine pedestrian safety audits at site by inspecting each element of the pedestrian facility

Once a facility has been constructed, the maintenance process begins. In order to supplement the auditing process described above, the following measures can be taken to assist in the identification of hazards.

6.2 Get Help from Community

Information pamphlets might be distributed to the community to make people aware of the potential severity of trip and fall incidents. Such material should produce a balanced view explaining the limited resources of Council on one hand, and the need to be informed by the public of deficiencies on the other. Epstein (Austroads, 1995) suggests that ignorance on the part of Councils is no defense against claims.

6.3 Inform Maintenance Workers

All maintenance workers and field staff should be instructed to immediately inform Council of any potential hazards to pedestrians in public places. Such notifications should supplement routine maintenance and auditing activities.

7) TREATMENT OF DEFICIENCIES

The treatment of deficiencies should (self evidently) be carried out as early as possible. As a temporary measure, the area of the deficiency should be barricaded, lit and sign-posted accordingly. Council should include these items in the urgent works schedule of the maintenance program. This process should also involve a safety audit at each stage by an approved independent reviewer. It is considered that if such a process took place, local government could reduce their potential liability by not only receiving less claims, but also by more successfully defending those claims received.

8) SUMMARY AND CONCLUSIONS

Trip/slip and fall incidents both in the workplace and in public places account for an extraordinary level of loss by the community. The development of various Standards and Guidelines over the past ten years has clearly set out the technical requirements of a “reasonably” risk free pedestrian environment. Most of the public places used by pedestrians are under the care and control of local government.

However the traditional resources available to local government make it difficult to supply that “reasonably risk free” environment. This paper has discussed an approach to help prevent such incidents by conducting pedestrian safety audits during the stages of design, planning, construction and maintenance of pedestrian facilities.

Based on our experience, many of the incidents which we have investigated might have been prevented by carrying out safety audits at various stages of the project. Involvement from both the community and local government would be helpful to identify deficiencies and treat them promptly.

Given that the community is aging, the test for "reasonableness" will become more difficult for employers and public authorities in the context of a safe walking environment. It is already the case that local government is decreasing its involvement in public recreation activities because of a fear of increased Public Liability insurance premiums.

Unfortunately, unlike a tidal pool or a playground, local government cannot close the footpath.

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