

Grate Expectations

The Essential Guide for the Modern Drainage Project



Introduction

Dependable drainage is indispensable to good building design.

Drainage maintains a simple albeit vital function: to ensure water, once used, can be efficiently, safely and effectively removed from the property.

Forasmuch as water remains an essential life preserver, so too can it prove the ultimate destroyer: after all, even a small leaky pipe can cause irreparable damage to structural foundations, ruin porous wall and floor materials, and offer fertile breeding ground for mould and pests.

Yet despite the fundamental importance of drainage to essential building functions, all too often the specification and selection of drainage systems is left too late into the construction process, or overlooked entirely.

Planning Ahead

Architects recognise that the key to project success is the time invested in planning, specifying and co-ordinating building tasks. However, it's clear that the built environment is becoming ever more complex, bound not only by the requirements of strict building regulations, but an increasingly sophisticated array of intricate and aesthetically driven designs.

While out of sight – and effectively out of mind – drainage plays an integral role throughout the building system; as such, its proper and timely implementation remains crucial to the effective functioning of the building. Knowing which system will best work for your needs will not only provide long-term cost and time-saving benefits, but essential provisions for the health, amenity and safety of building occupants.

The aim of this paper is to arm today's architects, specifiers, builders and skilled DIY practitioners with expert knowledge to select and implement the best drainage solutions across the entire built area – inside, outside and everything in-between.



Expert Tips for Selecting the Right Drainage for Your Building Project

For the Bathroom

1. Unique Design Concerns: Traditional vs. Linear

One of the most important decisions when considering bathroom drainage fit-out is how it will be incorporated into an existing room layout.

Traditional bathroom setups are designed with a single, fixed-positioned, primary drainage trap, which typically houses the central floor waste outlet (or overflow gully) for the entire bathroom. It is from this centralised drainage point that all other waste outlets from the bathroom's fixtures (showers, basins, bathtubs etc.) are connected, forming the bathroom's interconnected pipe system.

Yet an increasing number of bathrooms are plumbed with separate traps for each fixture, allowing for a more flexibility in your drainage system layout (most suitable for lineal systems).

While traditional floor waste systems require 4-way grading of floors, and a separate hob to contain water flow, linear grates can be located anywhere within the bathroom/shower area, requiring a simple 2-way floor grading towards the channel.

2. Waterproofing Requirements

Recent changes to the Australian Standards to AS-3740 ('Waterproofing of wet areas within residential buildings') introduced in 2010, means builders and designers must abide by strict waterproofing compliance measures to ensure interior spaces are protected from unwanted water incursions.

Your choice of surface material (whether tile, timber, stone or vinyl) will significantly impact your waterproofing requirements and requisite application of water-resistant membranes. Likewise, your building substrate material (whether wood or concrete) will ultimately determine the type of waterstop required for full BCA compliance.

For specific waterproofing guidelines, please refer to AS-3740.

3. Exposure to the Elements

Seldom considered for interior surfaces, properties located in areas exposed to high airborne salinity (e.g. near breaking surf beaches) require extra precautions to protect drainage systems from corrosion.

Electropolishing offers one of the most effective means to protect grates from harsh or corrosive environments, passivating rust-sensitive iron concentrations in stainless steel grates most prone to oxidation.



For Outdoor Spaces

Regular and persistent downpours remain part and parcel of Australia's erratic climes.

Yet it is our increasingly volatile climate extremes that are having the most profound effect on outdoor drainage designs. Indeed, despite an overall decline in rainfall, the Bureau of Meteorology predicts that the intensity and severity of rain storms is will increase markedly across the continent, putting increased strain on existing outdoor drainage systems.¹

It is imperative therefore that outdoor drainage can stand up to increasingly voluminous water flows, ensuring water can be effectively and efficiently conveyed from the property.²

Poor drainage design and surface grading can exacerbate surface runoff (an environmental hazard) and cause substantial damage to landscaped areas. Moreover, poor drainage flow, resultant from substandard drainage design and placement, remains the chief cause of ponding, which can degrade impervious surfaces and cause serious structural damage to the property.³

Key Considerations for Your Outdoor Drainage Project

1. Drainage Layout & Availability

One of the chief considerations for outdoor drainage sites is their access to existing plumbing and drainage systems.

The advantage of new building sites is that most allow for drainage systems to be established in order to meet the 'lay of the land', ensuring maximised water flow and adherence to best practice water-sensitive design principles (WSUD). However, older properties may offer fewer possibilities for alteration, and may be better suited to more traditional drainage arrangements.

Building surfaces (such as earth, stone or concrete) will also impact one's ability to move or increase the number of available drains.

2. Use of Outdoor Area

If your drainage area is heavily trafficked or used for vehicular access/parking, it is critical to ensure your drainage solution can bear the weight of these excessive loads.

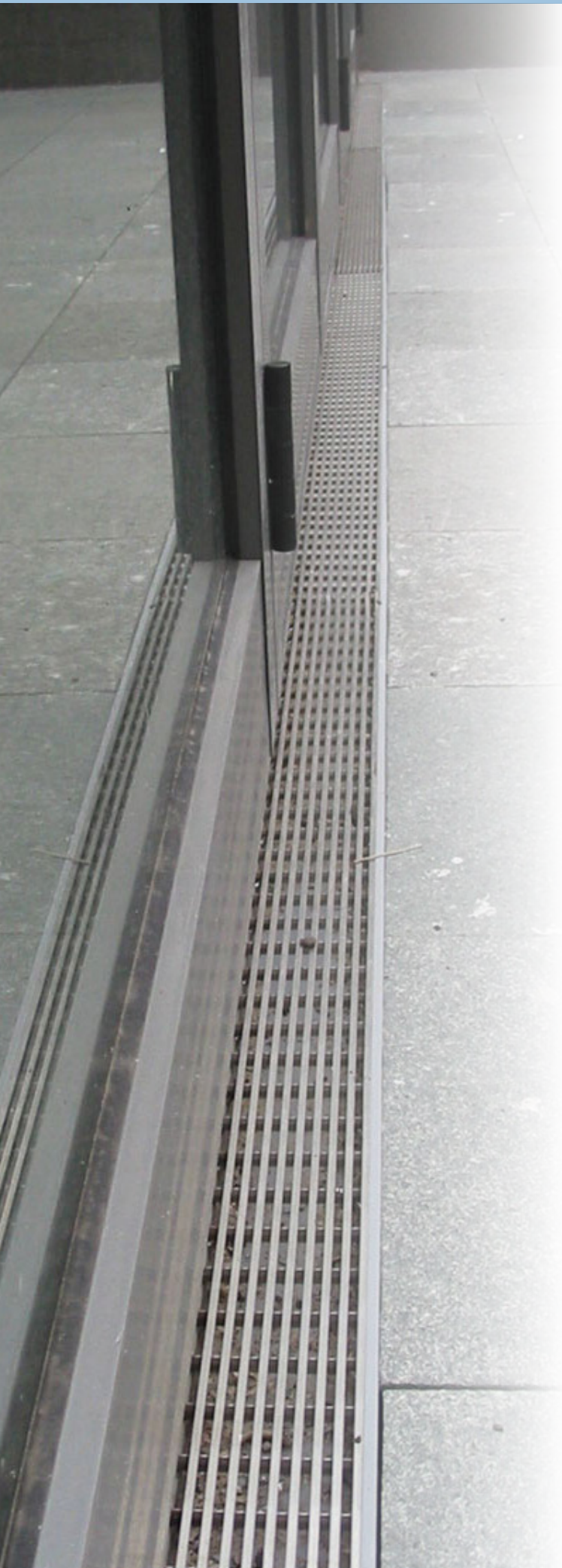
Many drainage solutions offer superior load ratings to ensure they can withstand these load forces and avoid buckling even under constant load pressures.

3. Environmental Concerns

Australia's unique environmental challenges will greatly impact on the type of drainage materials and grating required for your outdoor area.

Key external variables such as exposure to airborne salinity (i.e. proximity to seashore), tree debris (e.g. leaves and seeds), exposure to urban pollutants (e.g. PAHs and corrosive chemicals) and even weather (*dry arid* versus *wet tropical*) conditions will all have a significant impact on the type drainage you require and the materials best suited to withstand these unique environmental conditions.





For the Indoor/Outdoor Divide (Threshold)

One of today's most eye-catching architectural trends is the push to harmonise the traditional barrier between interior and exterior living spaces, often referred to as 'open air living'.

Marrying these traditionally discrete living environments presents a distinct challenge for architects, with the potential to expose interior spaces to inclement weather events and resultant water breaches.

Specifically designed to straddle the water-sensitive divide between the indoor and outdoor spaces, threshold drains deliver superior level-plane drainage beside the doorframe; a concealed, low-profile construction is not only a stunning visual statement, but a highly practical design feature, delivering universal access provisions for mobility impaired occupants.

However, while it may seem an impeccable option for any open air design, it is crucial for designers to recognise the unique architectural and building requirements of threshold designs to avoid potential installation pitfalls.

Key Considerations for Your Threshold Drainage Project

1. Flow Rates

Most linear drains are designed to convey up to 40 litres of water per minute.⁴ Designers should thus be mindful of the incidence and frequency of heavy local downpours (or shower flow rates in bathroom applications), localised flooding events, and the risk of potential overflow.

2. Timber or Metal Threshold

Doorway thresholds are installed beneath the door to help reinforce the doorframe. Door thresholds come in either wood or metal variants, each with distinct advantages: while wood offers a more versatile and cost-effective base for threshold drainage, it is susceptible to rot; metal (typically aluminium) thresholds present a more costly and less versatile option than timber frames, but are far less vulnerable to wear-and-tear stresses.

Due to the unique properties of each door threshold material, separate waterproofing provisions exist for each system. Please refer to AS-3740 and AS-4654 for specific guidelines.

For the Balcony

Like their open-air counterparts, balconies straddle the weather-sensitive divide between indoor and outdoor spaces, offering comparable challenges for architects and designers. What's more, the added constraints of balcony elevation and restricted surface areas present additional obstacles to the provision of effective drainage.

Indeed, owing to their limited surface areas, traditional balcony drainage solutions typically rely upon dome topped grates coupled with high gradient falls to support sufficient drainage flow, both of which create obvious trip hazards. Fraught by inadequate drainage flows and susceptibility to blockage (often caused by natural detritus), these systems must be supported by water-resistant membranes, applied meticulously across the balcony surface, to prevent water ingress. However, persistent weathering and haphazard installation practices mean that waterproofing membranes are all too often a key point of failure, prone to seepage.⁵

To overcome the evident shortfalls of centralised balcony drainage, homeowners have been increasingly drawn to level threshold solutions. Threshold is specifically designed for restricted balcony spaces, offering excellent drainage possibilities and unique 'no stepdown' provisions to support universal access.

Key Considerations for Your Balcony Drainage Project

1. Depth of Profile

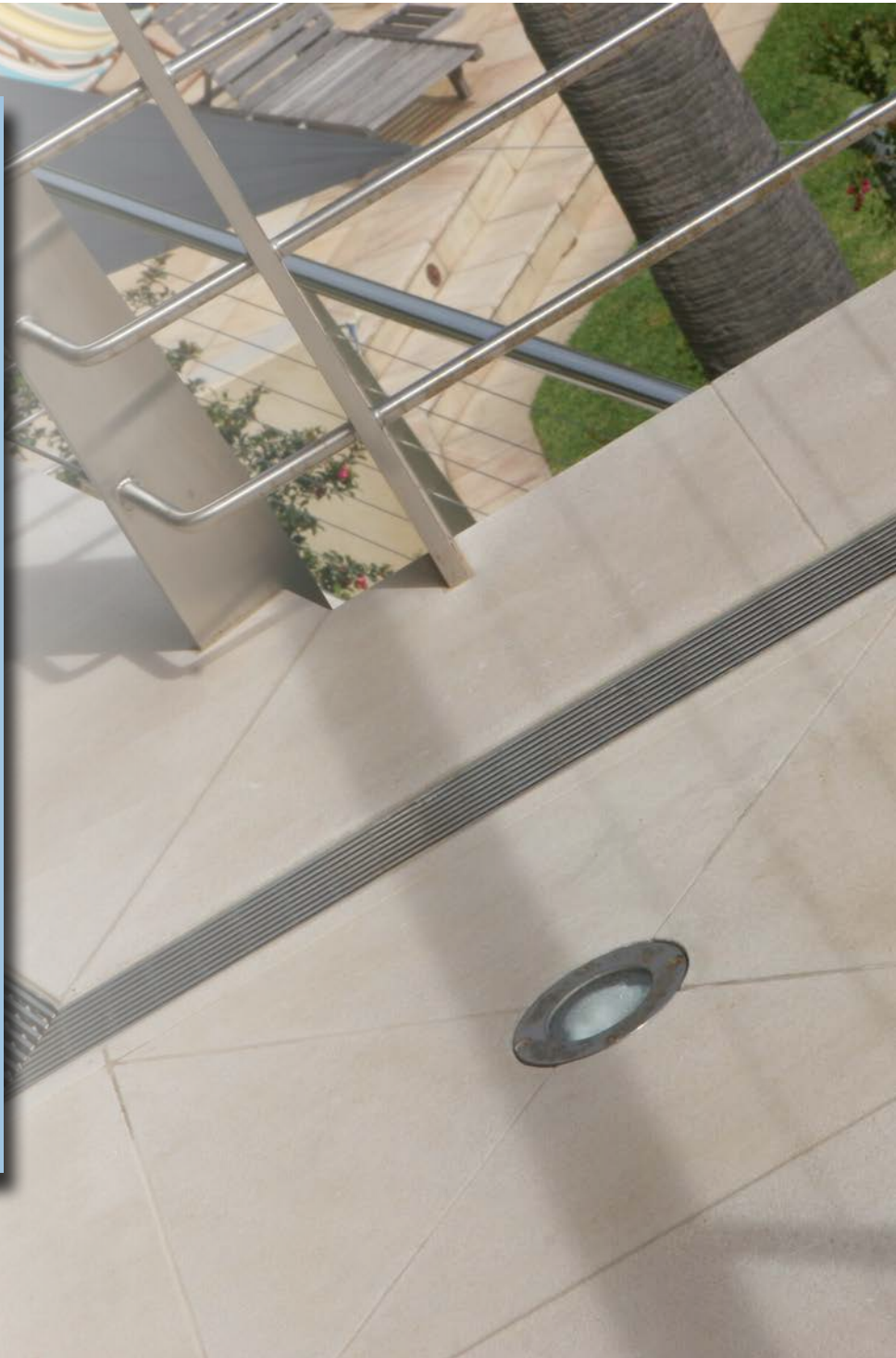
Careful consideration must be given to the depth of profile allowance within balcony spaces. A shallow depth profile will strictly limit the type of lineal drain solution that can be applied within the balcony space and will reduce overall flow capacity.

2. Drainage Placement & Downpipe Location

Precise placement of the lineal drain is crucial to the efficacy of the entire drainage system. Lineal systems are uniquely designed to sit parallel to walls or access points, or flush against the floor to ensure maximal surface coverage and superior water drainage.

To meet these requirements, waste outlets and connected downpipes can be positioned at the edge of the balcony area in order to connect with the threshold subsill; although multiple outlets spaced along the channel are more efficient.

While balcony piping and drainage outlets may be modified during the construction phase, the possibilities of major modification on existing constructions remains limited. In this case, a traditional central drainage solution is simplest.



Expert Advice from Australia's Premier Linear Drainage Manufacturer

Stormtech has been at the forefront of drainage innovations for home and commercial building industries for over a quarter of a century.

As one of Australia's most respected drainage manufacturers and suppliers, Stormtech is committed to delivering the highest quality drainage solutions for today's drainage projects.

Boasting an unrivalled depth of experience with linear drainage solutions, Stormtech welcomes questions about product selection and compliance, and can advise prospective clients objectively on the most suitable drainage product for your building project.

Stormtech's skilled specialists work closely with specifiers, architects and builders to offer tailored drainage solutions, including bespoke drawings and plans for customised drainage designs.

Stormtech works proactively with plumbing advisory services to ensure drainage is not only fit for purpose, but meets stringent Building Code of Australia (BCA) compliance measures.

All Stormtech products are WaterMark™ certified (Australia) and have US UPC and Canadian CSA approval.

With a proud commitment to eco-friendly design, Stormtech offers the only linear drainage product in the world with Global GreenTag® certification.

For further advice and expert tips for your next drainage project, contact **Stormtech** on (+61) 02 4423 1989 or visit us at www.stormtech.com.au.





^[1] Australian Government, State of the Climate 2014, Bureau of Meteorology (2014); <http://www.bom.gov.au/state-of-the-climate/>

^[2] K. Bergren, G. Svensson, & M. Viklander, 'Urban drainage and climate change: a problematic approach?', Mistra Swecia, Newsletter 1 (June, 2008)

^[3] Australian Building Inspection Services (ABIS), 'Drainage' (2014); <http://www.abis.com.au/drainage>

^[4] L. Hunter, '4 Linear Drain Installation Tips to Remember', *Remodeling* (2013); <http://www.remodeling.hw.net/products/kitchen-bath/4-linear-drain-installation-tips-to-remember>

^[5] Building Services Authority (Queensland), 'External Waterproofing Membranes: Best Practice Guidelines' (2010)

