

The Grate Outdoors

An Architect's Guide to Outdoor
Drainage Design and Specification



Introduction

Outdoor drainage systems help divert excess water that can accumulate around buildings and on hard surfaces. They are an indispensable part of any new build, especially as more Australians are prioritising outdoor spaces in new home designs. However, despite the importance of adequate drainage to essential building functions, consideration of drainage system selection is often left too late into the construction process.

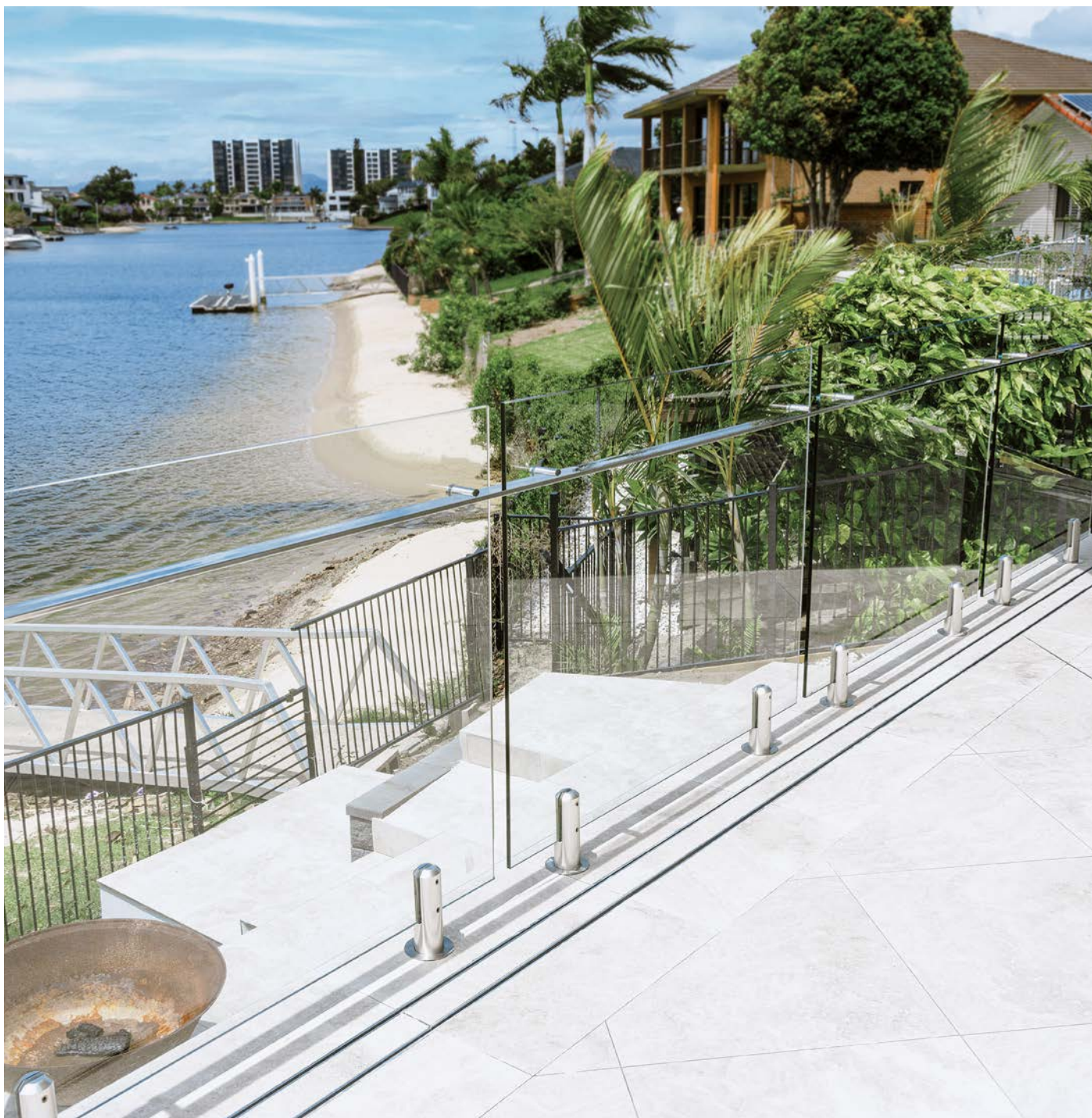
The consequences of poor drainage in water-sensitive areas can be disastrous. Substandard drainage design and placement can result in poor drainage flow, which is a major cause of ponding in outdoor spaces. Poor water management in such areas can degrade impervious surfaces and cause serious structural damage. In addition, pooling water and poorly-designed door thresholds can create safety hazards and increase the risk of trips, slips and falls.

Water-sensitive areas around a residential home include balconies, decks and pool enclosures. Drainage is required to isolate these external elements from the internal elements of the building, especially in multi-residential developments where water runoff from balconies on higher floors can adversely impact those below. Choosing the right solution will provide long-term cost and time-saving benefits, and ensure the proper functioning of the built area for the enjoyment of its users.

This whitepaper aims to provide architects, designers and specifiers with an essential guide to the key considerations in selecting outdoor drainage solutions with a focus on balconies, decks and pool enclosures.

“Designers can use the long clean lines of linear drainage to achieve a modern look and feel in outdoor areas.”





Drainage systems for outdoor applications

Outdoor drainage design focuses on two main objectives: managing surface water that accumulates in and around outdoor building areas, and slowing down water flow to reduce flooding, erosion or contamination problems downstream. In doing so, outdoor drainage prevents hazardous or objectionable conditions from developing around a building.

A common example of an area requiring drainage is balcony areas in multi-residential developments. When it rains, water can enter balcony areas. A lack of proper drainage on balconies can ruin the building facade over time, with water flowing over the edge of balconies. It can also create issues for tenants below, as water from the top-floor apartments can drip onto the lower ones below.

Swimming pool areas are another common example as water will overflow over the sides of the pool, requiring appropriate water drainage to maintain safe surrounds.

Water-sensitive areas like decks and balconies often straddle the divide between indoor and outdoor spaces. For such applications, threshold drains are an ideal solution to manage the transition from internal to external areas. A threshold drain consists of an external linear grate which sits beside the doortrack. An integrated sub-sill collects water and condensation around the doorway and conveys it to the external drainage system, providing an unbroken path between internal and external surfaces while preventing water from entering the premises.

Building codes and regulations

Drainage for decks, balconies, pools and other outdoor areas should be a major consideration in new builds, not only to protect the building and landscape, but also for compliance reasons. Keeping water out of a building is a requirement of the National Construction Code (NCC). The relevant provisions in NCC Vols. 1 and 2 are as follows:

- P2.2.1/FP1.3: Rainwater management requires that surface water resulting from a storm must not enter the building and must be conveyed to an appropriate outfall.
- P2.2.2/FP1.4: Weatherproofing requires that a roof or external wall must prevent the penetration of water that could cause undue dampness or deterioration of building elements.

Drainage must meet Australian standards for waterproofing under AS 4654 "Waterproofing membranes for external above-ground use". While these standards focus on the materials and installation of an external waterproofing membrane, they also include design criteria that must be considered to ensure that the waterproofing membrane system functions correctly and water can drain off the balcony. Part 2 of these standards (AS 4654.2:2012) covers design and installation of waterproofing membranes and refers to the drainage of roofs, decks and balconies where an external waterproofing membrane system is installed. It is aimed at eliminating water leakage at the sills of door openings that lead onto a waterproofed deck or balcony.

Designers must also consider the requirements of AS 1428.1:2009 "Design for access and mobility - General requirements for access - New building work" that allow a continuous path of travel from indoors to outdoors. Level threshold drainage is appropriate for accessible pathways as it eliminates the need to have conventional step downs that were once used to contain stormwater runoff. The thresholds at doorways of a continuous path of travel must meet requirements for rise, length, gradient and placement within the door leaf.

Key design considerations

Drainage layout

All building sites require an effective drainage system that channels runoff so that excess water flow is discharged effectively, and does not cause flooding or runoff into neighbouring properties. To achieve this, designers need an understanding of any existing plumbing and drainage systems on the site and how the surrounding landscape will impact water flows (including factors such as topography, soil, slopes, and vegetation). Some existing sites may be limited to traditional drainage designs, whereas new sites may allow greater design flexibility.

Usage of outdoor area

The intended use of the outdoor space will determine which drainage products will be most suitable. Areas that are subject to heavy foot traffic, moving vehicles and/or equipment will need drainage solutions that can withstand heavy loads. Designers and specifiers need to choose solutions with the appropriate load rating, or risk damage or failure of the product when in use.

Environmental conditions

Outdoor drainage systems are subject to environmental elements, which play a major factor in what drainage channel and grate you choose for your project. The drainage system will be subject to airborne salinity, weather elements, and urban pollutants, all of which can cause rust and corrosion. Solutions that cannot withstand such conditions may experience premature failure, requiring owners to replace them multiple times over the drainage system's lifecycle.





Evaluating drainage materials

The choice of materials for a drainage system is an important one, as it can impact its cost, longevity and performance. Poor quality drainage materials will corrode and degrade when constantly exposed to elements and through normal use. This can lead to poor drainage performance, premature failure and potential safety issues. Exposure to harsh sunlight can also result in degradation in the colour and appearance of drainage grates.

Grates are the principal drainage component exposed to the elements. The choice of grate material is often between stainless steel or anodised aluminium, though alloys and plastic composites are sometimes used. Anodised aluminium is especially suited for outdoor applications for several reasons:

- **Superior corrosion resistance.** Stainless steel offers good corrosion resistance, but exposure to continuously wet conditions can still result in rust. In comparison, anodised aluminium is essentially rust proof due to a self-repairing oxide layer that protects the metal inside. Anodising is an electrochemical

process that converts the metal surface into a decorative, durable, corrosion-resistant, anodic oxide finish. This protective layer is highly resistant to weathering, even in industrial atmospheres that would corrode other types of metals.

- **Strength-to-weight ratio.** Anodised aluminium is one-third the weight of steel and can be forged to be just as strong or stronger than some steel. Lightweight and easy to work with, anodised aluminium enables efficient and accurate installation, which can reduce construction costs. It is important to ensure the grate is independently load tested to ensure it is suitable for the proposed application.
- **UV resistance.** Leading brands offer anodised aluminum products that have been UV-stabilised so that they are protected from long-term degradation and colour fading from constant sunlight exposure. This will ensure the product maintains the desired appearance for a longer period of time.

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Lauxes Grates

Practical and aesthetic outdoor drainage solutions

Lauxes Grates are an elegant solution for outdoor drainage applications. Coming in different depths and widths with an option of standard grate or tile insert, these grates are ideal for balconies, swimming pools and other water-sensitive areas around residential buildings.

All Lauxes grates and components are made from anodised aluminium, greatly increasing their durability, even in challenging outdoor environments. The anodising process results in a superior finish and aesthetic look that enables a wide variety of contemporary designs. The anodising protects the underlying material with a protective coat almost as strong as diamond. All grates come with a lifetime rustproof warranty.

The corrosion-free nature of Lauxes grates means they are ideal for almost any usage, including balconies that require drainage from rain to swimming pool overflows from kids or storms. There is a Lauxes grate for any type of job. Lauxes grates are lightweight and easy to handle, ensuring quick and efficient installation.

All grates are customisable onsite saving time, money and preventing project delays. Lauxes grates are available in longer lengths (up to 5.6m), making them ideal for larger jobs. These qualities make these grates ideal for every project, from small residential builds to large volume industrial developments. Lauxes grates are not part of waterproofing, which saves on time and costs, as well as minimises the opportunities for mistakes on-site.

Lauxes grates stands apart from other brands in this category due to their unique designs. The company has spent years in development to arrive at the best material and channel structure for the job. A Lauxes grate will not only look good, but last a lifetime doing the job it was designed for.

About Lauxes Grates

Lauxes Grates is one of Australia and New Zealand's most exclusive designers and manufacturers of versatile indoor and outdoor drainage solutions. Their award-winning products are innovative, cost-effective, stylish, and certified under the WaterMark Certification Scheme

All information provided correct as of January 2022