Internal Wet Areas

Eliminating Defects Through Better Design and Detailing

Stormtech

INTRODUCTION

Bathrooms and other wet areas remain a leading source of construction defects in Australia, particularly waterproofing failures and inadequate drainage. Unlike superficial defects, these failures are sometimes difficult to identify until it is too late and often compromise the underlying structure, making rectification both invasive and costly. Corrective work frequently involves the removal and reinstatement of tiling, membranes and fittings.

The implications extend beyond material and labour costs. Defects in wet areas can erode client trust and delay occupancy. When defects surface after completion, they can expose projects to disputes, maintenance obligations and reputational damage that may linger long after project completion.

This paper addresses the factors behind persistent wet area failures and examines where current practice falls short. It also proposes a more effective approach to wet area design, focusing on thoughtful product selection and reducing the number of failure points. By providing design and specification strategies that enhance performance and reliability, the paper aims to provide architects with practical guidance to streamline wet area design without compromising performance or reliability.

Reducing system complexity is central to improving reliability in wet area design. Every additional junction or interface introduces a potential point of failure, particularly where different trades are required to coordinate work.

COMMON ISSUES IN WET AREA DESIGN

Industry evidence highlights the prevalence of waterproofing defects in multi-unit residential buildings across Australia. The ABCB's Consultation Regulation Impact Statement on waterproofing and water shedding found that between 20% and 40% of modern apartment buildings exhibit some form of waterproofing defect.[1] Over the past decade, leaking showers, bathrooms and balconies have consistently ranked among the most common defects, demonstrating that existing construction practices continue to fall short of achieving reliable outcomes.

Several recurring factors drive these failures:

- **Poor waterproofing practice**, such as insufficient priming or inadequate membrane thickness, permits moisture ingress that damages substrates.
- **Incorrect falls** are another frequent issue; when grading is inadequate, water ponds, accelerating grout deterioration and fostering mould growth.
- **Inefficient drainage** compounds these problems, with undersized point drains unable to cope with peak flow.
- **Material failures** also play a role: low-grade stainless steel and aluminium channels (not grates), and low grade plastic are susceptible to corrosion, warping or premature degradation, undermining system reliability

The consequences of these failures are significant. Rectification costs can far exceed the original installation, particularly when remediation requires the removal of finished surfaces.

Despite the known risks, a persistent misconception remains that compliance with the National Construction Code (NCC) and AS 3740 Waterproofing of Domestic Wet Areas is sufficient to guarantee performance. In reality, these standards define only the minimum requirements necessary for regulatory approval. They do not account for the full range of design and construction variables that affect long-term durability in complex, high-use environments.

The reliance on minimum compliance often stems from cost pressures and delivery timelines. Developers and contractors, under pressure to reduce upfront costs, may select the lowest-cost systems or limit scope to the statutory requirements. Similarly, tight construction schedules can encourage practices that prioritise completion and sign-off rather than optimised design solutions. While such approaches can achieve short-term savings, they overlook lifecycle performance and the higher costs associated with remediation if systems fail prematurely.

TOWARDS A MORE EFFECTIVE APPROACH TO WET AREA DESIGN

Improving the reliability of wet area design requires a shift from compliance-driven specification towards a performance-based approach. While regulatory standards establish a necessary baseline, they do not address the full range of variables that contribute to long-term durability. A more effective strategy is to prioritise **simplification** of design, selection of materials with proven **lifecycle performance** and specification practices that move **beyond minimum compliance.**

Simplification

Reducing system complexity is central to improving reliability in wet area design. Every additional junction or interface introduces a potential point of failure, particularly where different trades are required to coordinate work. By minimising overlaps between trades and simplifying detailing, projects are less vulnerable to errors in sequencing or workmanship. Straightforward falls and tiling geometries not only support effective water shedding but also enable more consistent workmanship across multiple units.

Lifecycle performance

Effective specification must extend beyond the initial installation phase. Materials should be selected with an expected service life equal to or greater than the building itself. For example, 316 marine-grade stainless steel offers superior resistance to corrosion compared to lower grades, or low-grade plastic components. Evaluating lifecycle costs is equally critical: the financial burden of remediation often dwarfs initial construction savings.

Beyond minimum compliance

The NCC and AS 3740 provide essential benchmarks, but they do not in themselves guarantee durable outcomes. Treating these standards as a baseline rather than a final objective enables a performance-driven approach. Specification should prioritise long-term waterproofing integrity, ease of maintenance and the safety of occupants.

Detailing and product choices should also anticipate the trajectory of regulatory change, such as increased emphasis on accessibility and the principles of Livable Housing Design. By exceeding minimum compliance, architects can deliver wet areas that are not only compliant at completion but also resilient, adaptable and reliable throughout the life of the building.

APPLYING BEST PRACTICE: SIMPLIFYING SHOWER DRAINAGE

Typical shower drain design

In conventional bathroom construction, shower drainage is often handled through a small, centrally located point drain. The floor is graded with four-way falls to direct water to this point. This approach is widely used because it aligns with the default detailing in many building standards and is compatible with prefabricated waste fittings. Waterproofing membranes are applied beneath the screed or directly under tiles, lapped into the flange of the floor waste. Tilers must then cut large-format tiles into smaller pieces or triangular wedges to achieve the required falls, resulting in multiple grout joints around the drain.

While this design is functional in principle, it introduces several potential failure points. The four-way slope requires high accuracy from the laying of the screed and tiling to prevent lippage or uneven joints. Grout joints located at the lowest point of the shower are vulnerable to deterioration from constant water exposure. Small capture zones mean that any debris, soap scum or hair build-up can quickly impede flow, increasing the likelihood of ponding. The interface between the waterproofing membrane, the drain flange and the tile bed also relies heavily on workmanship: any discontinuity or void at this junction can allow moisture to bypass the system and penetrate substrates.

Alternative approach: Linear drains

A more effective alternative is the linear drain, which addresses many of these weaknesses by simplifying both geometry and construction. Instead of four-way falls, linear drains only require a single slope or two-way fall. This reduction in complexity allows the use of large-format tiles without awkward triangular cuts, significantly reducing grout joints at critical points. The broader capture area improves hydraulic performance, particularly under high-flow showers, while fewer grout lines reduce the opportunity for water ingress. For installers, the simplified slope speeds up set-out, improves workmanship consistency and minimises coordination conflicts between waterproofers and tilers.

Beyond construction efficiencies, linear drains offer long-term design and lifecycle advantages. Flush-mounted channels support stepless shower entries, which not only comply with Livable Housing Design Guidelines and AS 1428.1 but also provide safer, more accessible bathrooms. At the threshold, the linear format reduces folding and termination of membranes, eliminating a common point of failure. Specifying durable materials such as marine-grade stainless steel ensures resistance to corrosion and chemical exposure, while the wider drainage path is less prone to blockage and easier to maintain.

Key takeaways

Linear drains address many of the weaknesses inherent in central point drains:

- **Simplified geometry:** Require only a single gradient or two-way fall.
- **Tile efficiency:** Allow large-format porcelain or stone tiles to be laid without awkward cuts.
- **Fewer grout joints:** Reduce pathways for water ingress and simplify waterproofing continuity.
- **Improved drainage:** Broader channel increases capture capacity and hydraulic performance under high-flow showers.
- **Faster installation:** Easier set-out reduces trade conflicts between waterproofers, screeders and tilers.

Design and lifecycle benefits

Linear drains offer performance advantages that extend beyond installation:

- **Accessibility:** Flush, stepless designs meet Livable Housing Design Guidelines and AS 1428.1 for safer, more inclusive bathrooms.
- **Fewer failure points:** Simplified thresholds reduce membrane folds and common leakage risks.
- **Durability:** Marine-grade stainless steel (316) or anodised aluminium (for the grate only, NOT channel) resist corrosion and staining
- **Ease of maintenance:** Wider channels and removable grates simplify cleaning and reduce blockages.
- **Lifecycle value:** Higher upfront costs are offset by lower defect risk, reduced maintenance and longer service life.

FROM THEORY TO PRACTICE: STORMTECH 120SCS SYSTEM IN ACTION

Best practice in wet area design is about more than compliance; it is about simplifying detailing, selecting durable materials and ensuring long-term reliability. **Stormtech's 120SCS Linear Drain with Integrated Shower Screen Support** represents this shift. By combining dual-sided drainage with structural support for the shower screen, the system eliminates one of the most common defect-prone interfaces in bathrooms. Water is efficiently captured from both sides of the screen, reducing failure points while maintaining clean architectural lines. Manufactured in Australia from marine-grade 316 stainless steel and available in a wide range of grate designs and finishes, the 120SCS offers both technical assurance and design flexibility.

To test how best practice translates to on-site outcomes, Stormtech conducted a controlled field study using its 120SCS Linear Drain with Integrated Shower Screen Support.

Project Woy Woy 120SCS Field Study

Overview:

Project Woy Woy tested two identical bathroom builds side by side to directly compare Stormtech's 120SCS Linear Drain with Integrated Shower Screen Support against a traditional floor waste system. Both bathrooms were constructed to the same layout, with identical materials and finishes and completed to tile stage.

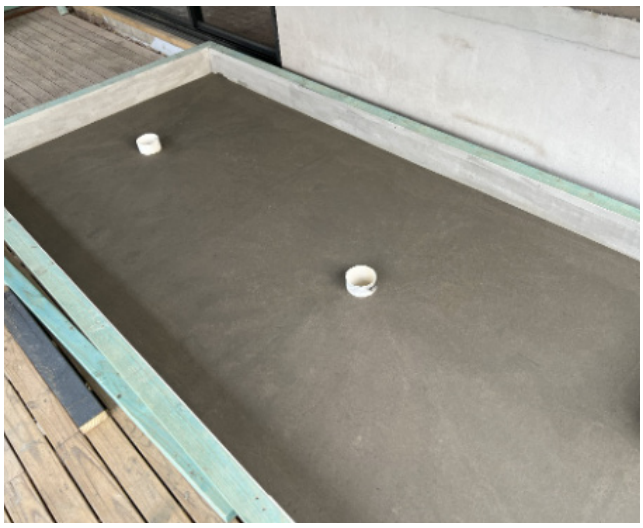
The goal was to objectively measure differences in buildability, installation cost and long-term performance potential under real construction conditions.

Key findings

The 120SCS system demonstrated a net-zero cost impact compared to conventional drainage. While material costs were slightly higher due to full-area waterproofing and the drain unit itself, these were offset by faster installation, simplified tiling with two-way falls and reduced preparation time. Importantly, the 120SCS design delivered superior waterproofing integrity and lower long-term failure risk, addressing the most common sources of bathroom defects.

By removing the need for multiple waterstops and complex four-way tile falls, the 120SCS enabled a cleaner layout with fewer interfaces between trades. The centrally located linear drain also improved hydraulic performance and eliminated ponding and leakage issues common with traditional centre wastes.

The Project Woy Woy field study concluded that while the 120SCS system introduced a modest increase in material cost, this was entirely offset by faster, simpler installation and further justified by its superior waterproofing integrity and reduced risk of long-term failure.



Installation of the 120SCS linear drain system (top) and the duplicate bathroom built with traditional floor wastes (bottom).

ABOUT STORMTECH

For more than 30 years, Stormtech has delivered innovative architectural drainage solutions for bathrooms, showers, thresholds, paved areas, driveways and pools. Renowned for sleek design and practical performance, Stormtech linear drainage systems are manufactured in Australia from high-quality 316 stainless steel and are available in both Made-to-Length and modular formats that can be cut on-site to suit project needs.

All systems connect seamlessly with standard plumbing fittings and are backed by WaterMark and Global GreenTag International certifications.

By exceeding minimum compliance, architects can deliver wet areas that are not only compliant at completion but also resilient, adaptable and reliable throughout the life of the building.

REFERENCES

[1] ACIL Allen. “Waterproofing provisions in NCC 2025: Impact analysis of proposed changes.” ABCB. https://www.abcb.gov.au/sites/default/files/resources/2024/Waterproofing-CBA-final-revised.pdf (accessed 11 September 2025).

All information provided correct as of November 2025

Stormtech