



# Avoid being a drip!

Waterproofing failure is one of the most common – and costly – problems in building, yet the incidence of leaks continues to rise, reports Jerry Tyrell.

*CPD Academy is a series of 'lessons in print' for Building Connection readers to help you improve your trade skills and business know-how for keeping your edge in a competitive market. Sydney consultant Jerry Tyrell, a co-founder of Tyrells Property Inspections, shares his insights into basic building practice – common problems, what to do about them and how to prevent them. Jerry has 30 years' experience as a labourer, tradesman, contractor, architect, mediator, building consultant and author. He has been involved in the inspection and building of more than 55,000 properties (including 30,000 timber pest inspections).*

Every year there are tens of thousands of complaints against contractors, subcontractors, manufacturers and suppliers – and the most costly complaints relate to waterproofing.

The main point about this vital part of good building practice is that it has to be right.

The cost of doing it right first-up is

about \$2.50/m<sup>2</sup> in terms of knowledge, teamwork and supervision. This should add no more than \$250 to the average job – a cost even the most penny-pinching client will pay when you explain the benefits and when you estimate the costs associated with waterproofing failure (which will inevitably include legal fees).

## Main problem areas

When it comes to waterproofing, the following areas should cause alarm bells to ring:

- External levels above or at the same level as interior
- Absence of setdowns in slab edges
- Ineffective cavity/threshold drainage
- Balconies/walls above habitable rooms
- Basement retaining walls
- Complex elements (planters, pools/tanks, joints in large slabs, etc).

The New Zealand trade publication *BUILD* has labelled these symptoms 'leaky

building syndrome' and has come up with '4Ds' relating to waterproofing:

- Deflection – first line of defence (roofs, flashing, etc)
- Drainage – insulation, cavity flashings, pipes, etc
- Drying – mostly ventilation and ensuring trapped moisture evaporates
- Durability – appropriate materials for the location.

I don't support the term leaky building syndrome – after all, it is only high-risk spots that leak, not the entire building – but I do agree in principle with the 4Ds.

Most waterproofing problems stem from not applying the 4Ds. Education and a commitment to identifying and properly detailing high-risk parts of a construction will solve the problem.

## How to keep buildings dry

Here are some questions to ask yourself when identifying and solving waterproofing problems: ►

### WHAT ARE GOVERNMENTS AND EDUCATORS DOING?

While it took more than two decades for government to work out that most showers were leaking, most designers and contractors still remain unaware of what constitutes best practice in waterproofing.

As a result, the industry is being 'drowned' in complaints about undrained cavities, and planter/pond leaks. Legislators need to make sure that educators are guiding students in all fields of building in relation to:

- Why buildings leak
- Identifying areas of high risk
- Ensuring work quality is OK
- When to get help for complex designs and installations.

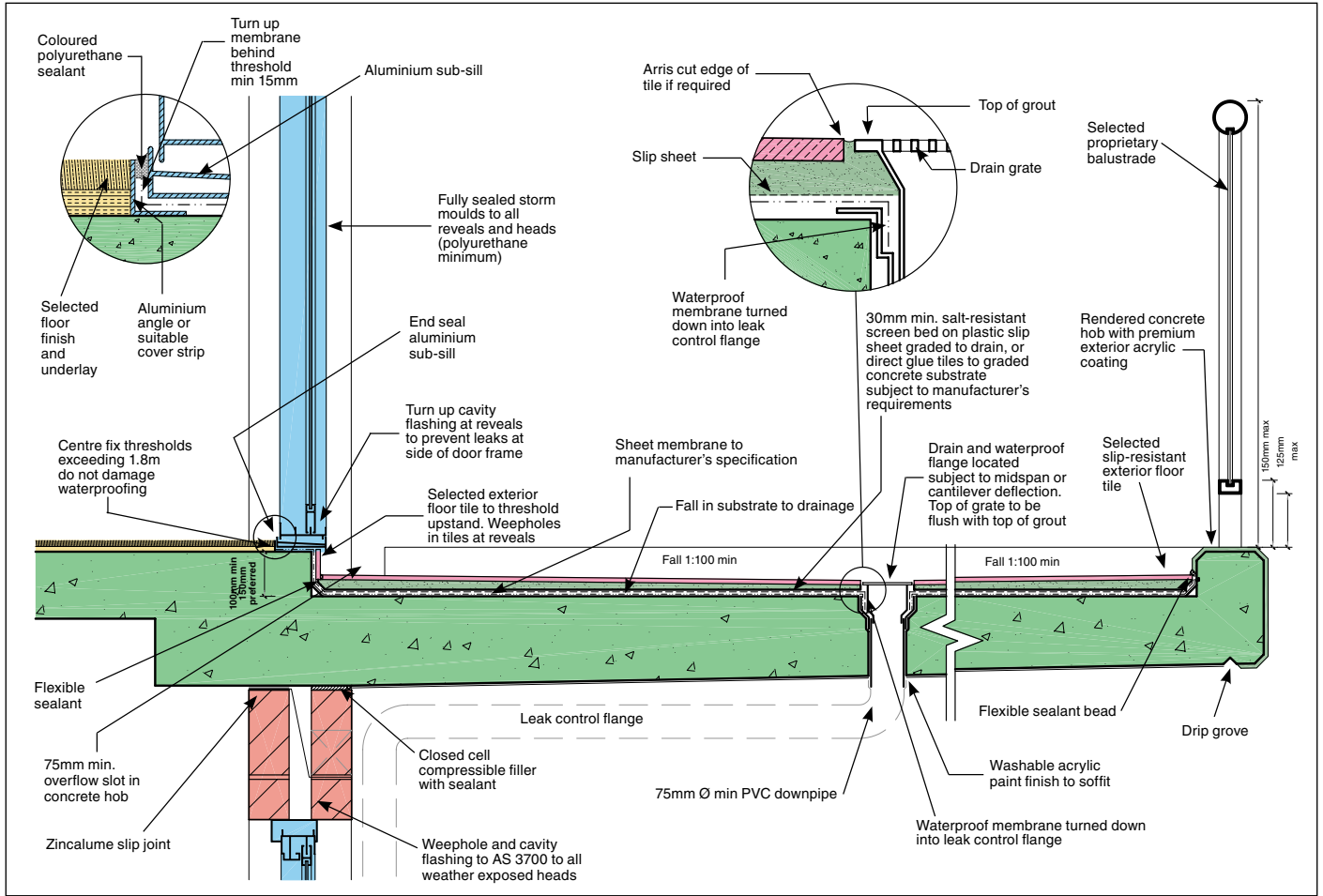
There's plenty of good information about waterproofing in Standards and other current publications, but it's just not being read and implemented by the industry.

At the moment, current industry practice goes something like this:

1. We learn next to nothing about waterproofing principles in our trade and university courses
2. Designers expect complex waterproofing issues to be solved by contractors
3. Contractors then rely on waterproofer (and often the cheapest quote)
4. Waterproofer use labourers, even with complex detailing
5. Everyone is paid before the first major leaks occur
6. The contractor underestimates the seriousness of the first call-back
7. The contractor doesn't know how to fix the problem and spends thousands with bandaid remedies
8. The problem escalates into a major dispute...

### Costs of a typical waterproofing stuff-up

Costs of a typical waterproofing stuff-up	
<b>COST OF PREVENTION</b>	
Initial cost of proper workmanship	\$45
Initial cost of proper materials	\$65
Initial cost of careful supervision	\$25
<b>REMEDIAL COSTS</b>	
Cost of 1st remedial attempt	\$550
Cost of 2nd remedial attempt	\$1,750
Cost of CTTT legal and expert costs	\$18,500
Cost of client's legal costs	\$27,700
Cost of another contractor fixing problem	\$35,600
Cost of lost time	\$5,350



(diagram © Jerry Tyrell and Neometro 2004).

Waterproofing detail for a typical balcony – note that all external fixings should be stainless steel and all floor tiles should be slip-resistant

## WATERPROOFING DON'TS

- Acrylic membranes under floor tiles
  - Flexible agricultural pipes behind basement walls
  - Subsoil drainage pipes above internal floor levels
  - Gardens/soil/paving above internal floor levels
  - Unsealed joints in cavity flashings above cavities that are below external paving heights
  - Weather-exposed thresholds without subsills
  - Balconies and box gutters without overflows
  - Water draining from tile beds to stain finishes.
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- Risk assessment – will the area leak if it is hosed or filled with water?
  - Barriers – what will keep the water out?
  - Gravity – will water drain away in all situations?
  - Drainage – will this always work?
  - Detailing – are materials and finishes combined properly?
  - Durability – will everything last the life of the building?

- Quality assurance – do you water-test anything that will be expensive to fix?
- Certification – applicators' accreditation, warranty from manufacturer and subcontractor?

### Balcony waterproofing

If every contractor or designer took the time to understand just one detail on the waterproofing of balconies, they would save the industry and consumers tens of millions of dollars a year.

The accompanying illustration (page 89) shows a typical balcony with door threshold, balustrade and drain.

The main checkpoints are:

- 100mm setback from inside to outside
- Use a subsill (seal the ends so water doesn't drain into cavity)
- Fall substrates to wastes

- Use leak control (puddle flanges) to drain tile bed
- Construct concrete upturn at balustrade to eliminate seepage/salt-staining to slab edge
- Install overflow slot or pipe in upstand
- Water-test everything above habitable areas for 48 hours minimum.

Talk with the designer, waterproofing contractor and client, and agree on solutions for any complex construction before it is built, not afterwards. Carefully supervise problem areas – for example, weather-exposed thresholds, planters against cavity walls, balconies over habitable areas – and ensure the designer or client confirms in writing any variations that depart from best practice.

Please email me any thoughts or experiences relating to waterproofing at [jtyrrell@tyrrells.com](mailto:jtyrrell@tyrrells.com) ■

*Next Issue: buildings v. termites*