



### **KEN SUTHERLAND** *BTech MIEAust RPEQ CPEng*

- Creator of [www.roof-gutter-design.com.au](http://www.roof-gutter-design.com.au) & [www.waterpipesize.com.au](http://www.waterpipesize.com.au)
- Managed a Hydraulic Consultancy as well as the Hydraulic Department of a large Engineering Consultancy for over 25 years.
- Worked for Local Government in Water Supply & Sewage, State Governments, Building Companies, Consultants, & Developers.
- Expert witness for many court cases.
- Worked as a Project Manager for various types of buildings.

## WORKSHOP SUMMARY

This workshop teaches the intricacies of the Plumbing Code in relation to the design of roof guttering and drainage systems.

Designing to the Code is quite different than designing for a Municipal system, or designing for the usual Civil Engineering application. There are a lot of simplifications, rules of thumb, tables and charts that must be complied with.

You will learn how to find the correct storm intensity for each different area of the building site, as roofs, gutters and site areas all have different intensities.

Roof gutters are spatially varied flow with interruption to the flow from the falling water, and bends (if any). The usual open channel flow formulas don't quite work.

A Down pipe is a vertical pipe that does not flow full, so the usual pipe flow formulas also can't be used.

Storm water pipe design is vastly simplified. Hydraulic grade levels, and pipes flowing part full are not involved. You will learn the simple techniques to replace this standard method, and how to save hours in design time.

This workshop will show you the correct approach to designing eaves gutters, box gutters, sumps, rain water heads, downpipes, and storm water drainage pipes to the Australian Plumbing Code.

Certifying Authorities are also beginning to insist on documentation by a recognized body (ie Engineers) verifying the design of such things.

With the advent of the National Construction Code, it is now possible to also design for cases that fall outside the limited range of the Plumbing Code. However, this design must be by a recognized authority (ie Engineers).

Also, Architects appreciate their engineers being able to help with their design development phase, which incorporates gutter sizing (especially box gutters), and downpipe sizing and location.

This workshop teaches how to do those things in accordance with the Australian Plumbing Code AS/NZS 3500.3:2015.

Computational Fluid Dynamics (CFD) will also be addressed.

## PROGRAMME (8.30 - 9.00 Registration)

### 9.00 - 10.30 Session 1

#### - BASIC HYDRAULICS

- How to find the ARI or AEP (the required storm frequency) for the area of the site in question, and how to find the storm intensity from the Bureau of meteorology web site.
- The effect of roof slope on the catchment area.
- The effect of vertical faces on the catchment area.
- How to find the catchment area for downpipes, gutters, and overland flow paths.



### 10.30 - 11.00 Morning Tea

### 11.00 - 12.30 Session 2

#### - OPEN CHANNEL FLOW

#### (Eaves, Gutters & Down Pipes)

- Open Channel Flow in relation to eaves gutters.
- Design of eaves gutters, downpipes and overflows. Code methods and formulas.
- Incorporating rectangular downpipes and semicircular eaves gutters.
- How to work from a given gutter size and find the size and number of downpipes required.
- How to work from a given downpipe size and find the number required and the required gutter size.
- How to work from a given number of DP's and find the size and associated eaves gutter size.
- How to design an overflow system for eaves gutters. Especially high fronted gutters.
- Design for valley gutters and flat roofs.
- How siphonic systems work.

### 12.30 - 1.30 Lunch (Provided at Venue)

### 1.30 - 3.00 Session 3

#### - OPEN CHANNEL FLOW (Box Gutters)

- Open Channel Flow in relation to box gutters.
- Finding the worst wind direction for box gutters.
- Sizing box gutters with the outlet at one end.
- Sizing box gutters with a sump and side overflow.
- Sizing box gutters with a sump and vertical overflow.
- Notes on how to go above the Code limit of 16L/sec.
- Overland flow paths.
- Rainwater head design.
- Pipes to tanks.
- Fail safe design.



### 3.00 - 3.30 Afternoon Tea

### 3.30 - 5.00 Session 4

#### - CLOSED PIPES SYSTEMS

#### (Concrete & Plastic Pipes)

- Site stormwater pipe design using concrete pipes and plastic pipes.
- Manning's formula.
- Colebrook -White formula.
- Tutorial

**CALCULATORS REQUIRED**

### 5.00 - 5.15 Certificate of Attendances & Feedback sheets

#### COURSE COST

- 1 day course – \$780 pp

#### DATES, VENUES & REGISTRATION

- Registration form (back of catalogue)
- Visit our website [www.etia.net.au](http://www.etia.net.au)

#### FURTHER INFORMATION

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