



DRAINS Core Workshop

Tuesday 22 to Wednesday 23 October – 9am to 5pm

ARR 2019 Morning Seminar

Thursday 24 October – 8:30am to 10:30am

DRAINS Advanced Workshop

Thursday 24 October – 11am to 5pm



WORKSHOP FORMAT

The DRAINS workshops comprise:

1. A two-day **DRAINS Core** workshop commencing with an ARR 2019 Seminar followed by an introduction to DRAINS, hydrological models including IL-CL, Horton ILSAX and Storage Routing Models, design and optimisation of street drainage and detention systems.
2. A one-day **DRAINS Advanced** workshop, including advanced modelling procedures, drainage system investigation, property & infill drainage examples, connections with GIS and 2D models.
3. A morning **ARR 2019 Seminar**, covering an overview of the guidelines applied to Urban Drainage design including new ARR probability terminology, the Initial Loss Continuing Loss (IL-CL) hydrological model, obtaining IFDs from the Bureau of Meteorology, ensembles of temporal patterns, IL-CL losses, pre-burst depths and climate change factors from the ARR Data Hub, and the Regional Flood Frequency Estimation Model (RFFE).

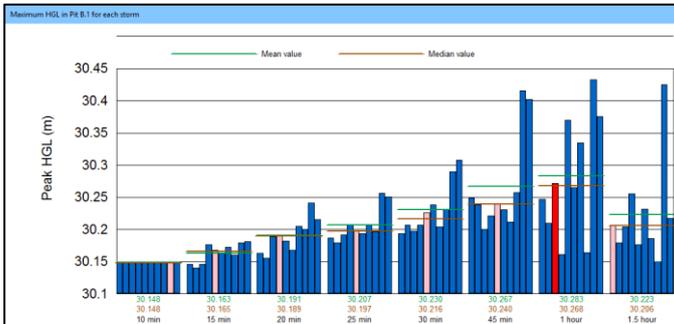
Release of ARR 2019 – The Final Document

Australian Rainfall & Runoff (ARR) 2019 has released a final version of the guidelines.

Bureau of Meteorology (BoM) provides 2016 intensity-frequency-duration (IFD) data.

The ARR Data Hub provides loss data, ensembles of ten temporal patterns for rainfall design bursts of various AEPs and durations and preburst rainfall.

DRAINS is available from www.watercom.com.au and incorporates these patterns into DRAINS and applies the new ARR 2019 design procedures.



DRAINS Peak Median Chart showing Pipe Flow Results utilising New ARR 2019 Procedures

VENUE

Saxons Training Facilities

Level 1, 140 St. Georges Terrace
Perth WA 6000
08 9466 2410

All training is on individual PCs, working with DRAINS examples, spreadsheets and tutorial exercises.

PRESENTERS



Dr. Benjamin Kus, Lead presenter of the DRAINS workshops with more than 15 years of consulting engineering experience and one of the authors of the ARR Guidelines.



Hossein Ansari, Consulting engineer and Council's Civil Design Engineer with more than 12 years local experience who joins Ben as Co-presenter to share his practical experience at the DRAINS workshops.

WORKSHOP FEES & DATES

Registrations close 11 October

DRAINS Core + ARR 2019 Workshop ¹	DRAINS Advanced Workshop ²	ARR 2019 Seminar ³
22-23 October 9am to 5pm	24 October 11am to 5pm	24 October 8:30am to 10:30am
\$1,500 +GST	\$700 +GST	\$250 +GST
\$800 +GST		
\$1,800 +GST		

The contents of each workshop are outlined overleaf.

QUESTIONS & REGISTRATIONS

To register for a workshop, please visit www.kustomengineering.com.au and select the registration button for the applicable course.

If you have any queries or require more information for a workshop, contact Benjamin on **0412 327 568** or email: admin@kustomengineering.com.au

Other courses that are available include:

Adelaide: DRAINS Core & Advanced – 20-22 Aug 2019
Sydney: DRAINS Core & Advanced – 24-26 Sep 2019

Brisbane: DRAINS Core & Advanced – 3-5 Sep 2019
Melbourne: DRAINS Core & Advanced – 15-17 Oct 2019

For full information and registration options, visit www.kustomengineering.com.au



COURSE CONTENT

DRAINS Core Workshop (22-23 Oct 9am-5pm)

- Morning seminar covering an overview of the ARR 2019 guidelines, terminology & procedures;
- 2016 IFDs from the Bureau of Meteorology (BoM) and ensembles of temporal patterns, losses, median preburst depths & climate change factors from the ARR Data Hub;
- Introduction to the DRAINS interface, the operation of DRAINS, and design procedures;
- Step-by-step construction of a DRAINS model using the ARR 2019 design procedures;
- Configuration of various hydrological models including IL-CL, Horton ILSAX, Storage Network Routing Models (SNRM) and calculating Probable Maximum Precipitation (PMP);
- Flow times, calculating pit inlet capacities, estimating and revising pit loss coefficients, and exploring various utility spreadsheets;
- Customising the DRAINS Pit, Pipe & Overflow Route databases for your project;
- Stormwater drainage system characteristics, design principles, methods, and tools;
- Comparing the ARR 2019 procedures with earlier methods;
- Overflow route flood mapping;
- A review of capabilities and components of DRAINS with a greenfield design example and exercise;
- Overview of data exchange with other software - Civil Site Design (www.civilsurveysolutions.com.au);
- Design optimisations of greenfield DRAINS designs;
- Applying the premium hydraulic model in DRAINS;
- Detention basin design and analysis, including modelling complex arrangements with the use of the premium hydraulic model.

DRAINS Advanced Workshop (24 Oct 11am-5pm)

- Preliminary investigation of greenfield drainage networks and evaluation of established systems;
- Examples of (a) a new development combining piped and trunk drainage systems, and (b) analysis and remediation of an existing system;
- Property drainage practice and infill development problems;
- Exercise on a flood-affected location and a property development;
- Combining DRAINS with HEC-RAS & GIS;
- Modelling large drainage networks, open channels, culverts and bridges;
- Application of storage routing models (RORB, RAFTS & WBNM) to developed and undeveloped catchments.

ARR 2019 Morning Seminar

(24 Oct 8:30am-10:30am)

The ARR 2019 Morning Seminar is intended for persons who are interested in understanding how to apply the guidelines to Urban Drainage. It will cover:

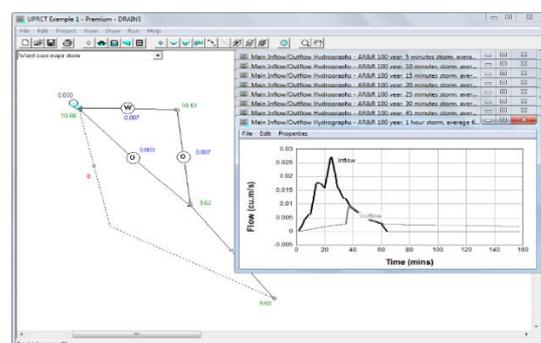
- An overview of the ARR 2019 guidelines applied to urban drainage design;
- New ARR Probability terminology;
- Obtaining data from the ARR Data Hub & Bureau of Meteorology (BOM);
- Overview of hydrological models;
- The new Initial Loss (IL) - Continuing Loss (CL);
- Modelling Ensembles of Temporal Patterns;
- Regional Flood Frequency Estimation Model;
- Overview of applying the ARR 2019 procedures in DRAINS.

THE SOFTWARE

Over 950 Australian organisations have purchased DRAINS since 1998. The program is compliant with ARR 2019 rainfall inputs and design procedures. This software offers:

- Design and analysis procedures for urban drainage systems using initial and continuing loss model (IL-CL), ILSAX, rational method and storage routing hydrology with unsteady flow hydraulics;
- Connections to spreadsheet, CAD and GIS programs, Civil Site Design and 12d;
- An effective user interface, Help system, manual, design data for inlet pits, a free Viewer; and
- Responsive support and regular training.

You can download a demonstration version of DRAINS, examples and the user manual from www.watercom.com.au. Contact Watercom Support at info@watercom.com.au or (02) 6649 8005 [phone/fax] for further information.



Detention Basin Design