



Assessing Directly Connected Impervious Areas in Residential Subdivisions in Western Sydney, NSW

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Building momentum requires us not only to adopt new ways of managing stormwater, but also to ensure that our approach to designing stormwater infrastructure is based on the latest available research.

The latest edition of Australian Rainfall and Runoff (ARR2016) recommends that the Effective Impervious Area (EIA) be used for runoff estimation rather than Total Impervious Area (TIA). According to ARR 2016 the use of TIA "can result in the overestimation of urban runoff volumes and peak flows". This conclusion is based on a number of research publications dating back to the 1970s including recent Australian research undertaken specifically for ARR 2016 as described by Thomson et al., 2012; Phillips et al., 2013 and in the 2013 ARR Project 6 Stage 2 report.

The research was based on established gauged urban catchments across Australia. However newer residential catchments have a much higher lot density than the research catchments. There is a lack of published data for Directly Connected Impervious Areas (DCIA) on current subdivisions.

As a step towards addressing the lack of impervious area data for current subdivisions a detailed evaluation was undertaken of DCIA for five residential subdivisions in four different Local Government Areas in Western Sydney. This evaluation consisted of the following:

- Measuring road pavement areas, footpath areas and driveways for representative areas of road reserve from design drawings; and
- Calculating lot imperviousness from Building Envelope Plans, the NSW Housing Code, design drawings for integrated developments and House and Land Package information.

Relationships for DCIA were derived from the data. It is hoped that these relationships will provide more accurate estimates of impervious area for design and master planning.

The results were also compared with the guidance given in ARR2016 and the values reported by Thomson et al, 2013 as well as the guidance given in the respective Council guidelines. It is concluded that the DCIA estimates are significantly lower than TIA in the Council guidelines

References

Phillips, B.C., Thomson, R.S., Goyen, A.G., Pathiraja, S. and Ball, J.E. (2013) Estimating Effective Impervious Area and its Implications for WSUD, Proceedings, Stormwater NSW Conference, 17-19 September 2013, Blue Mountains,

Thomson, R.S, Phillips, B.C., Goyen, A.G., Pathiraja, S. and Griffin, M. (2012) "How Connected are Urban Catchments? Estimating the Effective Impervious Area", Proceedings, 34th Hydrology & Water Resources Symposium, 19 - 22 November, Sydney.