



Rainwater Tanks - Limitations as FRM Devices

Summary

This floodplain risk management (FRM) guideline provides advice on the limitations of rainwater tanks and their effectiveness in managing flood risk.

Introduction

Water Sensitive Urban Design, including rainwater tanks, is being put forward as an effective means to reduce water usage and improve water quality. Rainwater tanks can collect rainfall from all or part of the roof. This water can be reused in watering lawns and toilet flushing among other uses.

Rainwater tanks collect runoff from storm events and therefore have the potential to impact upon the peak flows leaving a site. However, the potential to have a significant impact on major flooding external to the site is limited and needs to consider the following points:

- It does not take much rain to fill a tank. 10mm of rain over 200 square metres of roof or 20mm over 100 square metres of roof, would add 2 cubic metres or 2000 L to a tank.
- Not all water reaches tanks. A reasonable loss occurs as gutters overflow in flood producing rainfall events that result in significant flood problems that are the interest of FRM.
- FRM would generally be interested in events of a minimum duration of 30 minutes or longer, rather than the shorter 5 to 15 minutes duration storms that produce peak flows off individual sites. Longer duration storms have larger volumes which are more likely to be well in excess of tank capacity and therefore the influence of tanks is limited.
- Pre-incident rainfall may result in a reasonable amount of water in the tank reducing its effectiveness. Design rainfall events do not generally include pre-incident rainfall.
- Using tanks for toilet flushing and other household uses means that they need a minimum water level for this purpose, with topping up from town water. This would reduce the available storage for rainwater.
- The impact of rainwater tanks will have more influence of peak flows in smaller events and may lead to reduced stormwater pipe system capacity. However, given that the impact of tanks on larger events will be less than on smaller events there is likely to be more flow outside the pipe system, ie, more overland flow to be managed. Therefore flood problems are unlikely to be reduced if the impacts of rainwater tanks is considered in pipe system design.
- The critical storm duration may change to a higher total volume storm or longer duration storm with rainwater tanks. This may mean a slight, but not always significant, reduction in peak flows.

Recommendations

Overall, rainwater tanks are very useful in reducing water demand on centralised water supply systems.

However, they are unlikely to have a significant impact on flooding.

Therefore, rainwater tanks should not be considered as a FRM measure to significantly reduce downstream flood flows.