ROOFWATER HARVESTING

Case Study: Federation Square, Melbourne

EARTH SYSTEMS
Environment - Water - Sustainability

LOCATION

Federation Square is located directly opposite Flinders Street Station in Melbourne, on the banks of the Yarra River (Plate 1). The facility has become Melbourne's favourite meeting place, with over 8 million visitors each year.

CLIENT

Federation Square Pty Ltd (in collaboration with City of Melbourne and City West Water).

BACKGROUND

Federation Square is working on a number of sustainability projects to achieve improved environmental outcomes. Site water management is a key focus of the Environmental Management Plan.

Plate1: Spatial data was used to calculate site catchment areas and potential water yield.

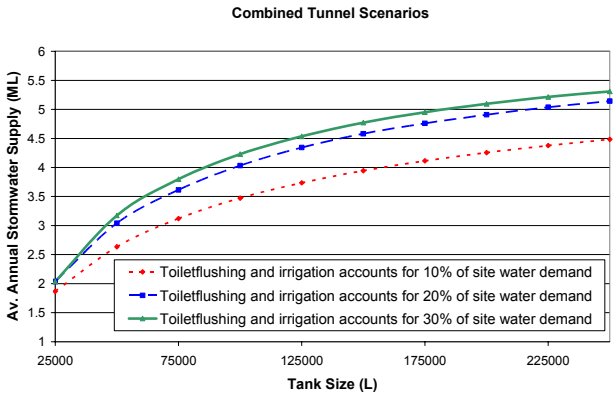


Figure 1: Modelling showed that a 125kL capacity storage could harvest 4.5ML of roofwater each year, assuming 20% of the site water demand was supplied by roofwater.

WORK PROGRAM

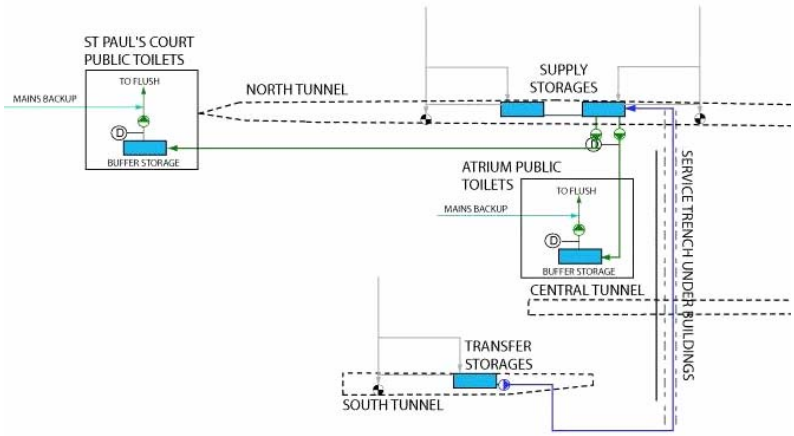
Earth Systems was engaged to conduct an assessment of stormwater volumes and quality generated at the Federation Square site. A key aim of the work program was to identify the lowest risk opportunities for potable water substitution. Roofwater was identified as the highest quality runoff available on site, with the potential to recover 4.5 ML per year from the available roof area. Replacement of potable water in on-site public toilets was identified as preferred uses for Roofwater.

A purpose-built computer model that assesses optimum tank dimensions based on a location's daily rainfall and a specified daily water demand was used to investigate a range of Roofwater harvesting scenarios (Figure 1). An economic assessment concluded that a water capture and distribution system which had moderate water storage capacities offered the lowest Net Present Value (NPV) and break-even cost for water supplied.

OUTCOMES

Based on the results of the water quality risk assessment, hydraulic modelling and economic assessment, a concept design (Figure 2) and detailed functional specification was developed for a Roofwater harvesting and re-use system for Federation Square. This system involves the storage of Roofwater in two bladder tanks at separate locations in subsurface maintenance tunnels, which are joined and plumbed into the public toilets located in the public forecourt and plaza areas of the site. This design provides the lowest risk option, uses existing drainage infrastructure and optimises potable water substitution on site.

Figure 2: Schematic of the Federation Square Roofwater harvesting system.



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