

City of Santa Monica Urban Watershed Management Program

Low Impact Development Strategies

Rooftop Rainwater Harvesting for Indoor Use

Santa Monica Pico Branch Library

2201 Pico Blvd.



Photo by William Short

←[Santa Monica Pico Branch Library]



←[12,000 gallon cistern]

[underground vortex screening device]→



[advanced treatment train]→



The Santa Monica Pico Branch Library, completed in 2014, is Santa Monica's first municipal building to harvest rainwater for indoor use and to achieve the coveted U.S. Green Building Council's LEED™ Platinum status for innovative design. The project demonstrates the feasibility of harvesting rooftop rainwater for direct onsite indoor use: toilet and urinal flushing. The rainwater harvesting system is a practical solution that promotes overall sustainable water management and helps Santa Monica achieve its aggressive water self-sufficiency goal by 2020.

The rooftop rainwater harvesting project is a Low Impact Development (LID) strategy that implements Best Management Practices (BMPs), a proven approach for addressing urban runoff from new development, redevelopment, and building retrofits.

Rainwater is harvested from the roof of the library and the adjoining community center and then directed to an underground vortex screening device for pre-treatment to remove any sediment and debris (PHOTO bottom left). The water leaving pre-treatment is stored in an adjacent 12,000 gallon cistern (PHOTO top right). Overflow from the cistern is directed to the storm drain. Indoor water demand triggers water to be pumped through an advanced treatment train (PHOTO bottom right) which includes a sand filter, microfiltration and ultra-violet light disinfection. The treated water is stored in a 305-gallon "day" tank. This highly treated water is used for toilet and urinal flushing. In the event that the rainwater cistern is empty, a sensor sends a signal to a valve to release fresh drinking water into the pipe leading from the day tank to the facility.

A one inch rain event harvests 8,300 gallons from the building roofs. In an average year of rainfall, this equates to 100,000 gallons, replacing 80% of the expected annual demand from toilet and urinal flushing in the facility. The project also included two infiltration chambers, not connected to the cistern system, intended to infiltrate other sources of runoff from the site.



A Cleaner Santa Monica Bay

Urban runoff flowing through storm drains is the single greatest source of pollution to the beaches and nearshore waters of the Santa Monica Bay. While water pollution from point sources like sewage and industrial discharge has been successfully controlled since the passage of the Clean Water Act in 1972, combatting pollution from urban runoff remains a unique challenge requiring a wide range of solutions.

In 2000, the City of Santa Monica updated its municipal code with a set of rigorous standards and strategies addressing urban runoff pollution. The ordinance, refined and expanded in 2010, requires a substantial reduction in urban runoff flowing off all impermeable surfaces from newly developed or retrofitted parcels in the city.

Reducing the amounts of urban runoff and of pollutants contained in the runoff contributes to the health and safety of our community. A cleaner bay means a healthier marine ecosystem and improved quality of life for residents. It also increases Santa Monica's appeal to visitors and businesses.

The strategies and techniques used to manage stormwater and runoff are known as Low Impact Development (LID).



Putting the LID on Urban Runoff

By using LID strategies and implementing Best Management Practices (BMPs), land development and redevelopment can be done sustainably, and in the name of “smart growth”. LID is an economically and environmentally responsible strategy for site development that also yields lower costs in the long-term. Whether implemented in residential, large commercial, or public projects, LID integrates land planning, site design practices, and construction techniques to mitigate development impacts to land, water, and air. LID conserves and protects natural resources and ecosystems, and reduces infrastructure costs.

LID strategies look at each development project as both a small micro-watershed, and also as a part of the greater watershed or drainage basin in which it is located. LID promotes the concept of “start at the source,” that is, to keep as much precipitation on each parcel as possible, minimizing the amount of runoff or waste water that leaves the site. Ideally, this approach goes hand-in-hand with maximizing onsite rainwater and runoff harvesting, retention, and use. And that is another way to prevent runoff pollution from reaching the Santa Monica Bay. In the end, to be successful, watershed management must include the individual, and be practiced on each parcel.

For more information contact **310-458-8223** or visit **sustainablesm.org/runoff**



Urban Runoff & Watershed Management Program

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