ONE DROP AT A TIME

Los Angeles green street design stores rainwater for groundwater recharge

By Jason Pereira

Severe drought conditions, resulting in California Gov. Jerry Brown's executive order imposing a mandatory 25% water use reduction in April 2015, have challenged local agencies to devise innovative approaches to expand water resources in the Los Angeles area. The city of Los Angeles' Laurel Canyon Boulevard Green Street project embodies this new paradigm by creatively capturing rainwater, which otherwise would typically flood the project area during a rainstorm, to replenish the adjacent aquifer.

Rainwater is a valuable resource that the Los Angeles Department of Water and Power (LADWP) plans to tap into through its Stormwater Capture Master Plan, released in August 2015. With an estimated 58 trillion gal of water flowing into the ocean yearly, according to the Southern California Water Replenishment District, capturing a portion of this runoff offers a tremendous opportunity. Rainwater was once viewed as a threat due to flooding in the early 1900s. Design guidelines and building codes aimed to allay public fears and encourage economic development by controlling, eliminating and diverting rainwater quickly. The Stormwater Capture Master Plan embodies a fundamental shift in this approach by outlining various programs to take advantage of storm water as a valuable, underutilized resource.

Greening the Streets

Green Streets is one program outlined in the plan and represents an important element in the multipronged initiative to expand water resources, thereby reducing the city's dependence on imported water.

The project is scheduled for completion in the summer of 2016.

Green streets incorporate sustainable design to improve mobility, community and the environment through the use of BMPs to manage storm water runoff adjacent to its source. In addition to the replenishment of the city's ever-diminishing groundwater aquifers, the benefits of green streets include improved water quality, enhanced neighborhood aesthetics and the creation of sustainable communities.

The Laurel Canyon Boulevard project, in the community of Pacoima, is one such green streets project. The LADWP, in partnership with LA Sanitation – City of Los Angeles, embarked on this project, which is scheduled for completion in the summer of 2016.

Project Logistics

The project area is along 1,000 ln ft of Laurel Canyon Boulevard and is adjacent to Pacoima Middle School. The area is prone to localized flooding due to its lack of a storm drain system and its dilapidated sidewalks. This project will increase groundwater recharge, reduce flooding impacts, improve water quality, enhance neighborhood aesthetics and increase the safety of local students by replacing existing hazardous and unsightly sidewalks. The improved sidewalk design includes new gutters, Americans with Disabilities Act-compliant curbs and sidewalks and a series of attractive parkway infiltration bioswales with California native plants, thereby improving the neighborhood's quality of life.

In addition to alleviating flooding, the project will provide educational outreach to the community, including to the adjacent middle school, regarding watershed issues and environmental stewardship. Education is a key component in creating public awareness regarding the importance of sustainable infrastructure projects.

"In densely populated areas like Pacoima with limited public spaces, looking to alternative areas under public jurisdiction to implement water quality and resource improvements becomes imperative to complying with state regulations for water quality," said Vik Bapna, CWE principal and designer of the Laurel Canyon Boulevard Green Street project.

Storm Water Path

During rain events, storm water flows through adjacent properties, streets and along sidewalks, picking up trash, oil spills, bacteria and other contaminants. Once the project is complete, this runoff will enter the infiltration swales through curb openings and recharge the groundwater basin. As the runoff inflow exceeds infiltration capacities, it will allow a portion of the runoff to enter dry well systems within the swale. This water

continues to travel through the soil for hundreds of feet until it reaches the San Fernando Groundwater Basin. Once in the basin, it can be pumped for further treatment and distributed through the potable water supply system, augmenting groundwater recharge, which is vital to sustaining the long-term reliability of the city's local groundwater supply. Rerouting, filtering and using this water will also improve water quality in the Los Angeles River, which would normally be this untreated water's outlet.

This project will collect storm water runoff from a 125-acre drainage area through these infiltration swales and dry wells to replenish the San Fernando Groundwater Basin with up to 13 million gal per year, enough water to provide for 80 families of four people for a year.

The State Water Resources Control Board provided $2 million of funding under the Proposition 84 Storm Water Grant Program. Along with the funding came aggressive grant-funding timelines. The heightened demand created an ambitious timeline, which was challenging due to the nature of this multijurisdictional project. Efficient coordination among local residents, who voluntarily dedicated a portion of land across the front of their properties for the project, and the local agencies involved was imperative in keeping the project on track. The agencies included LA Sanitation – City of Los Angeles, LADWP, Los Angeles Department of Transportation, Los Angeles Conservation Corps and Los Angeles City Council member Felipe Fuentes, 7th District.

Projects incorporating water capture and infiltration, like Laurel Canyon Boulevard Green Street, are on the fast track to demonstrating regionally effective approaches to expanding and protecting the future water supply and serve as a replicable model for local communities regarding how to successfully implement new green street projects across Southern California. SWS

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Along with offering a host of environmental benefits, the project will provide educational outreach to the local community.