



AFFORDABLE HOUSING DEVELOPMENT PROJECTS AND STORMWATER COLLECTION AND USE

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Geosyntec



Bolivar Park Stormwater Capture Project

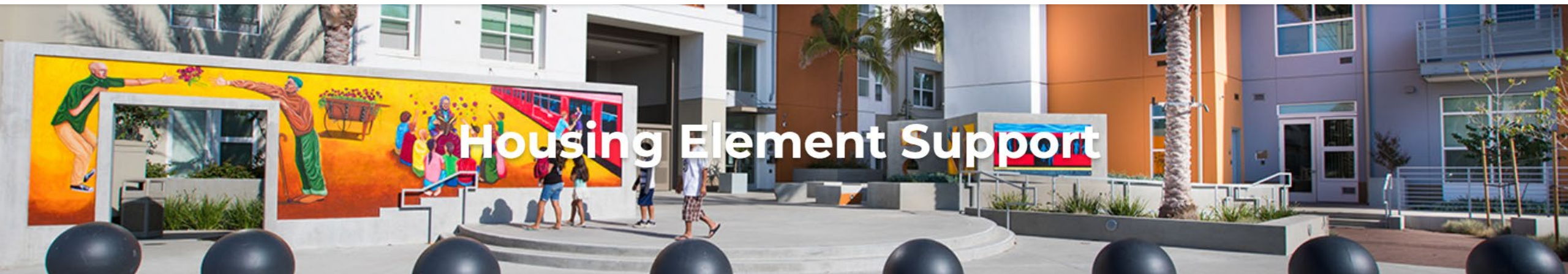
Goal

The goal is to educate on the topic of implementing stormwater collection systems with affordable housing developments

Affordable Housing Needs



- Shortage in affordable housing throughout California, including San Diego and Imperial Counties
- SANDAG region alone must accommodate over 170,000 new housing units within zoning by 2029



Affordable Housing Needs



- Affordable housing developments on tight schedules with limited funding
- Additional challenges include:
 - Land and labor costs
 - Regulatory hurdles
 - Community opposition
 - Tax cuts that lower the advantage of tax credit funding
 - Rising interest rates
 - Complexity of aligning several sources of funding for a single project
- Funding credits usually don't fully cover water reuse capital or O&M costs
- Overall lack of incentives for developers to implement reuse solutions unless there is significant capital funding and/or other benefits.



Safe Landing Project

Architects: KFA and JRMA

Engineer/Stormwater: Fuscoe Engineering

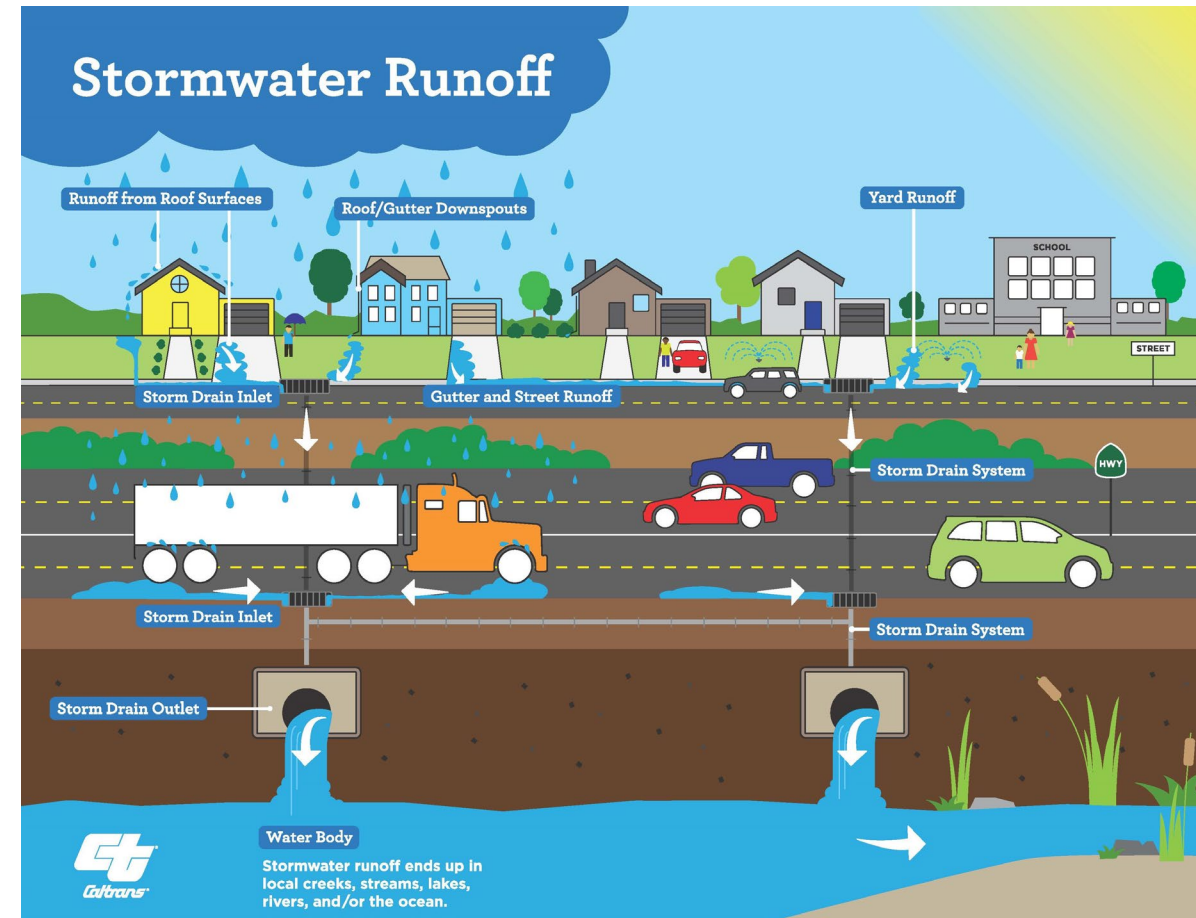
Funded by Measure H, LA County's tax-based program to generate funds to support homeless services and short-term housing



Developments and Stormwater



- Local Stormwater Permits (MS4) require collection and treatment of the “first flush” of stormwater prior to discharging from the development site
 - Infiltrate stormwater into the ground
 - **Collect and use** stormwater for irrigation or toilet flushing
 - Treat and release the stormwater back into storm drain and ocean
- **Collection and use** of stormwater typically proven to be infeasible
 - Local regulatory challenges on feasibility
 - Overall higher cost compared to alternative stormwater compliances options



Caltrans Image



County of San Diego Stormwater Management



SAN DIEGO REGION Stormwater Capture and Use Feasibility Study

FINAL | November 2018



Example Stormwater Use Projects

Planned/Conceptual Projects (Continued)

Santa Monica Sustainable Water Infrastructure Project

The City of Santa Monica, as part of their Sustainable Water Infrastructure Project (SWIP), is implementing a recycled municipal wastewater treatment and conjunctive reuse project at the planned SWIP Recycled Water Treatment Facility (SRWTF). The proposed project will have the capacity to harvest and divert approximately 4.5 million gallons of stormwater from a single storm event into the SRWTF (Alternative G).



San Diego Safari Park

San Diego Zoo Safari Park – Green Parking Lot and Stormwater Capture and Use Project

The San Diego Zoo Safari Park in Escondido proposes to use innovative best management practices to capture, treat, and reuse stormwater from two parking lots. The 52-acre concept project utilizes low-impact development techniques, including permeable pavers and improved surface materials, to capture 5.1 acre-feet of stormwater per year. As runoff from parking lots often carries oils, grease, heavy metals, and other environmental stressors, the captured stormwater will be treated through a biofiltration system before being used for irrigation within the Safari Park (Alternative C).



Los Coches Creek

Dry-Weather Flow Diversion at Los Coches Creek Outfall, Alternative 1

The Ray Stoyer Water Reclamation Facility in Lakeside is investigating the feasibility and benefits of augmenting flow through the facility by diverting dry-weather discharge from a site adjacent to the Los Coches Road Bridge (Alternative F). The diversion would increase flows through the facility by 2.6 million gallons annually. The diversion would also serve to reduce pathogen levels in discharge to Los Coches Creek.

Olivenhain Municipal Water District 4S Ranch Pilot Stormwater Treatment for Recycled Water

This conceptual project at the 4S Ranch Water Reclamation Facility would expand the production of recycled water using captured and stored stormwater (Alternative H). Stormwater would be treated using the older 0.2 million gallons per day (MGD) treatment facility that has been replaced and upgraded by a new 2.0 MGD treatment system. Stormwater would be collected from the community MS4 and stored in a basin or underground vault on public lands. Stored stormwater would then be diverted at a controlled flow to the facility as a separate inflow from the wastewater.



4S Ranch Water Reclamation Facility

San Marino Drive Green Street and Dry-Weather Flow Management

This concept-level project in the community of Lake San Marcos in Unincorporated San Diego County proposed to use green street best practices (including low-impact development features and incorporating smaller impervious areas) to treat and infiltrate the persistent dry-weather flow that currently enters the County's MS4 system along San Marino Drive. In addition to capturing and treating the dry-weather flow, the proposed project will discharge the captured stormwater to the groundwater and help restore natural hydrology for biological purposes (Alternative B). The project will incorporate approximately 9,500 square feet of green street low-impact development. Quantities of stormwater captured and infiltrated are not yet available.



San Marcos Drive

Mission Valley Stormwater Capture Project

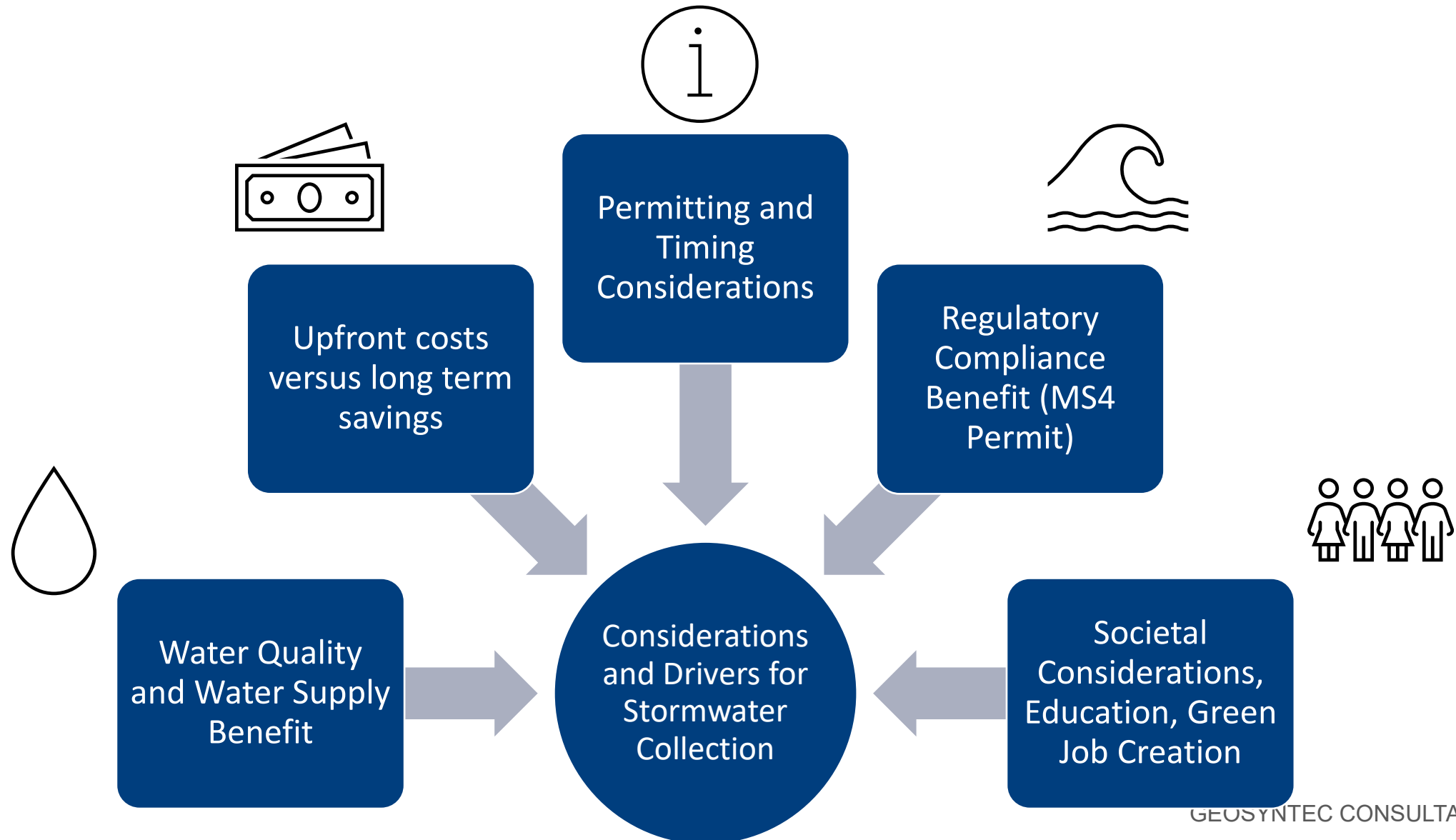
This concept-level project within the City of San Diego will help achieve the City's desire to focus on a strategic stormwater capture framework that will help address a number of water management concerns, including maintaining a reliable and local water source, improving water quality in impaired waterbodies, and flood risk reduction. The City of San Diego has identified a parcel located upstream of the SDCU Stadium at the approximate confluence of three stream or tributary systems – the San Diego River, Alvarado Creek, and Fairmont Channel. The City of San Diego plans to install both a detention facility paired with an injection well, and an infiltration gallery on the identified parcel for direct discharge to designated groundwater basin for future potable-use extraction (Alternative A). These conceptual facilities could potentially receive runoff from four diversion structures, for a total of 1,900 acre-feet per year of captured stormwater.



Map of the Project Site, Stream Inputs, and Their Corresponding Drainage Areas
Source: TetraTech, 2017



Stormwater Collection and Use



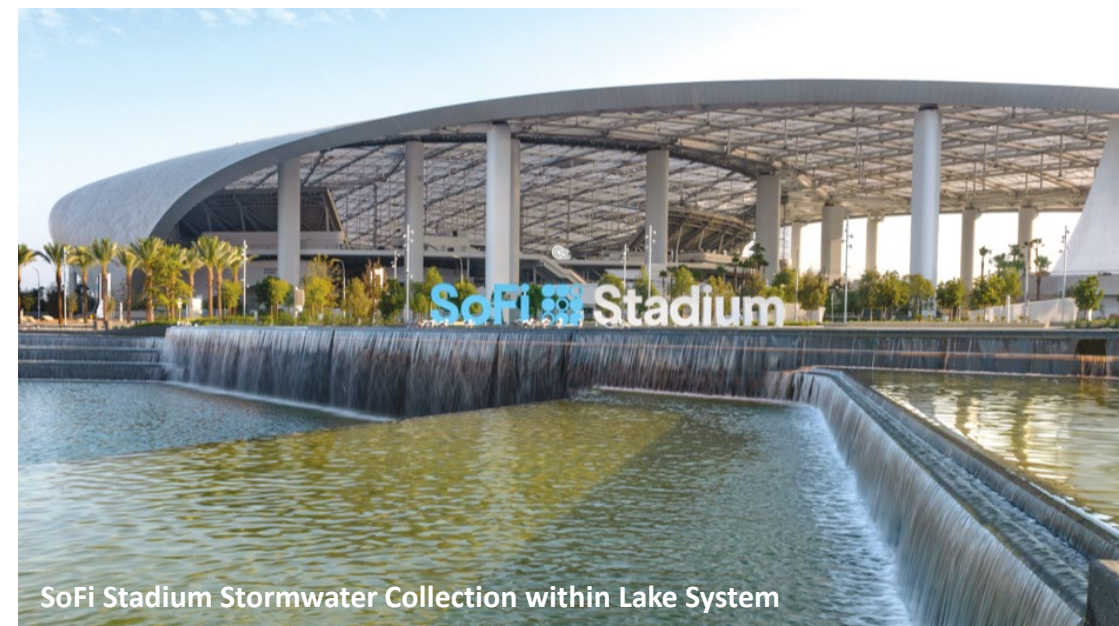
Scales of Stormwater Collection



Small Scale Residential Rain Barrels



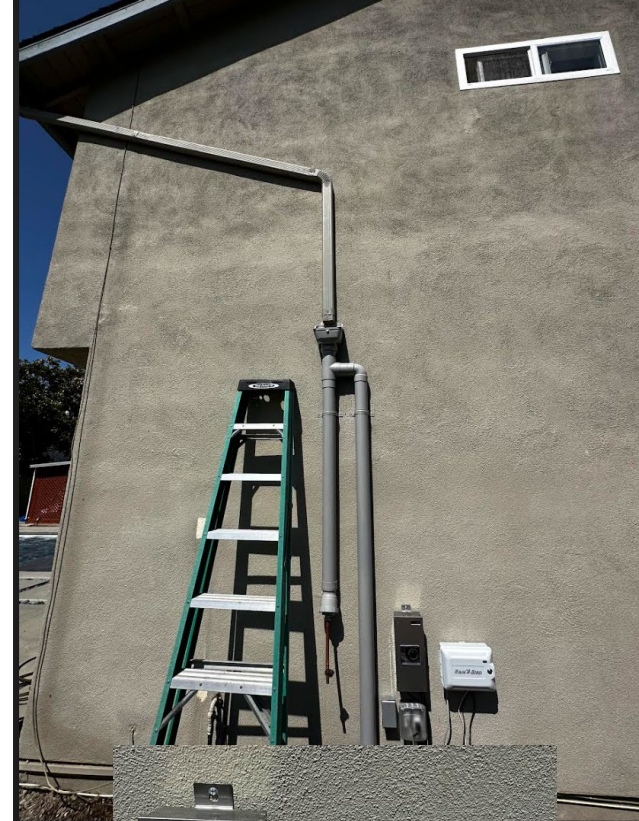
Large Scale Stormwater Collection and Use



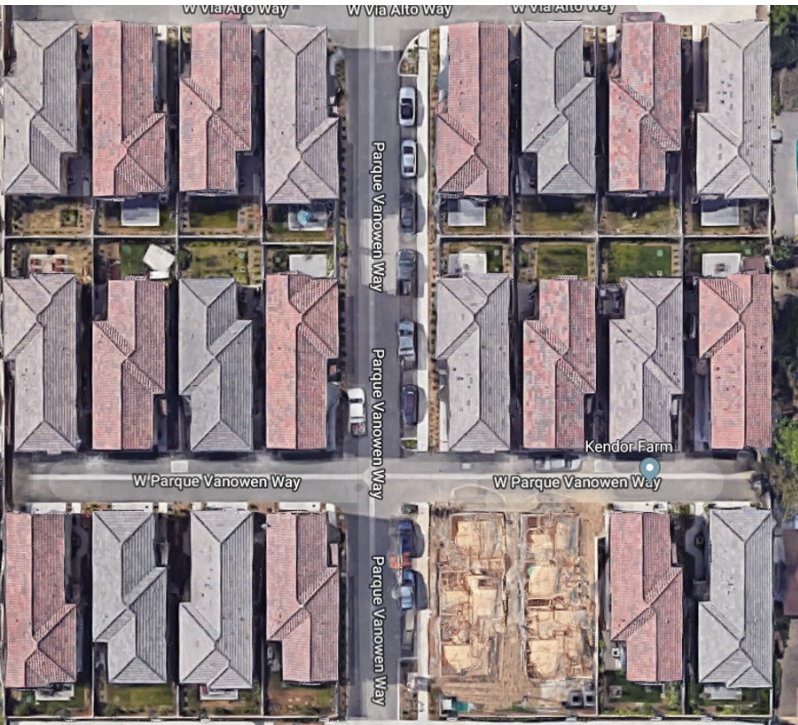
Case Study – Existing Development Retrofit



- Above ground stormwater collection system for residential home in Huntington Beach
- Rebates obtained
- Plumbed to backyard sub-surface irrigation system

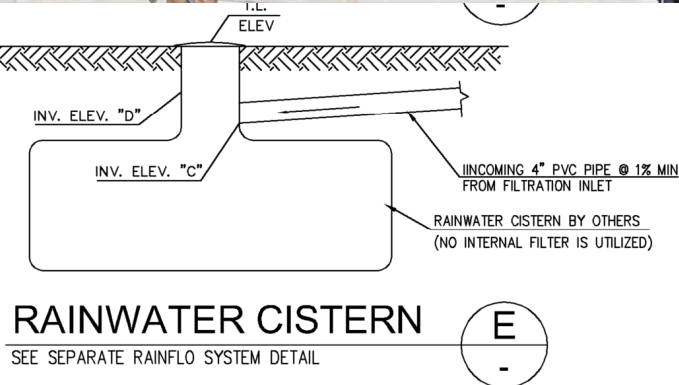
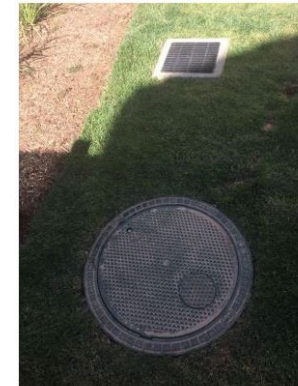


Case Study – New Development in City of Los Angeles



Van Owen Residential Stormwater Capture and Use Project

Civil Engineering and Stormwater Design by Fuscoe Engineering



CISTERN WATER. SUBSURFACE IRRIGATION ONLY. DO NOT DRINK.

GEOSYNTEC CONSULTANTS



Affordable Housing and Stormwater Collection



**Via Verde Affordable Housing
Apartment/Townhome Project in New York**
Stormwater Collection and Use for Irrigation of
Green Roof and Landscaping



**The Rose Affordable Housing Apartment
Project in Minneapolis**
Stormwater Collection and Use for Irrigation
of the Community Garden



Additional Resources – Stormwater Collection & Graywater Reuse



National Wildlife Federation Texas Coast and Water Program

Ensuring One Water Works for All:
**OPPORTUNITIES FOR REALIZING
WATER REUSE IN AFFORDABLE HOUSING**

Jorge Losoya, Jennifer Walker,
Amanda Fuller, Jonathan Seefeldt



- There are many constraints with implementing stormwater collection and use systems with development projects in Southern California, despite local water supply benefits
- Affordable housing development projects have additional challenges towards implementing water reuse solutions
- There are some funding opportunities available but they may not provide enough incentive to implement stormwater/graywater reuse systems
- Additional incentives could be explored to help make reuse technologies more attractive to developers
 - Standard reuse technologies that are known to municipalities for ease of review/approval
 - Additional credits offered to help provide more funding for reuse technologies
 - Waived permitting fees
 - An entity to provide O&M services for a reduced cost
- There are opportunities to more broadly implement both stormwater and graywater solutions with development projects, but additional education, guidance and incentives are needed



THANK YOU

Questions?

Additional Funding

- GreenPoint Rated (vs. LEED) is utilized to help individual projects stand out and be better recognized by funding sources (e.g., low-income housing tax credits); **however, water conservation was not perceived as a significant category within GreenPoint Rated.**
- GreenPoint Rated was also believed to be less costly to get accreditation than LEED.
- Stakeholders did not seem to utilize **water rebates and generally perceived them to be insufficient to cover increased construction and operational costs associated with many water conservation and/or reuse best practices.** Affordable housing projects often require many grants/sources of funding which is a significant challenge to manage; therefore, applying for other sources of funding (e.g., water rebates) has an administrative burden as well.
- There is interest in learning about subsidies that offset construction costs (e.g., design, construction, training etc.) and on-going operational costs (e.g., inspections and maintenance).

<https://www.greenpointrated.com/greenpoint-rated/>

