

URS Orange County Great Park, Irvine CA

Water Management Plan Phase I Storm Water Reuse Pond System

Water Reuse – Orange County Chapter June 19, 2014



Background on the Orange County Great Park

- Largest-scale Metropolitan Park of the 21st Century
- 1,200 acres on former MCAS El Toro, in Irvine.
- **Guiding Principles from 2007 Great Park Master Plan:**
 - Be forward thinking in innovative design
 - Implement programs for environmental sustainability
 - Lead the charge on environmental stewardship





Former Site of MCAS EI Toro





Original 2007 Great Park Master Plan modified through public park design review in 2011





Park Development Challenges

Cost to irrigate planned non-native landscaping

Cost to construct canyon, lake, and other water features

WQCB municipal storm water permit requirements for new development

Iow impact development (LID) features to capture, treat, and release (eventually reuse) design storm volume.



Solution – Prepare Water Management Plan for Build-out of Park

Begin with a Water Balance Model and Graphic to:

- Locate water storage features throughout Park to maximize storage of <u>on-site</u> runoff
- Examine diversion of <u>off-site</u> storm water flows to on-site storage water features
- Model volume requirements for storage versus historical rainfall data; dry and wet years
- Identify maximum water needs throughout Park and adjust landscaping plant palettes



Water Balance Model



* On the order of half of runoff volume captured by BMPs is assumed to be recovered.



WMP Graphic for Feasibility Analysis





WMP Recommendation

Build approx. 260 acre-feet of raw water storage at full build-out, plus BMP/other treatment facilities and low water demand plant palette would:

- Produce approx. 60% of Park's irrigation demand during typical rainy season and approx. 40% on an average annual basis. Big life-cycle cost savings!
- Meet existing and future storm water permit requirements and protect downstream receiving water quality
- Be expandable/scalable for future phases of Park build-out
- Provide potential LID mitigation credits for adjacent development (potential revenue source)
- Results in a sustainable park design!

First Phase Implementation of WMP

Storm Water Reuse Pond System at the Great Park's 30-acre South Lawn Soccer Complex







WESTERN SECTOR PARK DEVLOPMENT PLAN as per Approved PDR



South Lawn and Ponds under construction March 2013





Construction – June 2013





Pond Treatment System





Construction of Pond 4 (reflecting pond)





Initial Filling of Pond 5 (reflecting pond)





Completed Ponds 4 and 5 – Sept 2013 with viewing deck and walkable timeline





Construction of Pond 1– Summer 2013





Pond 1 construction completed Sept 2013





South Lawn Soccer Complex and Walkable Historical Timeline Completed Sept 2013



Pond 1 prior to 2/23/14 -2/24/14 rain event





Pond 1 after 2/24/14 storm





South Lawn Pond System – Notable Facts

- **i** Could provide approx. 55% of irrigation demand for South Lawn
- Meets storm water permit requirements; helps protect water quality of downstream receiving waters
- Designed to be expandable. New areas can flow to South Lawn ponds; decrease LID costs for future Park build out
- Frovides LID compliance opportunity for adjacent development
- Low electrical consumption (200,278 Kwh/yr); could be powered by 10,000 sf of solar panels
- Aligns with Park's sustainability goals
- Design qualifies for LEED certification

Recent Recognition

- Froject recognized by state water quality officials as a "Major breakthrough in cost effective storm water capture and reuse design."

- 2014 Award of Excellence American Council of Engineering Companies – Orange County Chapter (ACEC-OC)



Acknowledgement of the Project Team

- Orange County Great Park Corporation/City of Irvine Mike Ellzey, Assistant City Manager/CEO Great Park Corporation
- **URS Corporation** Program Engineering
- WRNS Studio Architecture
- **Sherwood Design Engineers** Civil Engineering
- **Sellinger Foster Steinmetz** Landscape Architecture
- **MCK** Construction Management
- **USS Cal Builders** General Contractor

Update: FivePoint Communities 688-Acre Plan



GREAT PARK DEVELOPMENT AREA SITE MAP Great Park Master Plan [2011]; Great Park Neighborhoods Development [2011]; 688 Acre Park Plan [3/18/14]



Questions?





