

Inland Empire Utilities Agency Headquarter Buildings *Project Highlights*

Platinum Certification
LEED v2.0

City of Chino, California

Project Team

- Owner: *Inland Empire Utilities Agency*
 - *Eliza Jane Whitman, P.E. – Project Manager*
 - *Dave Wall, - Construction Project Manager*
 - *Neil Clifton, P.E. – Manager of Engineering and Construction Management*
- LEED Project Contact: *CTG Energetics, Inc.*
- Architect: *La Canada Design Group*
- Interior Architect: *View Design Studio*
- General Contractor/Construction Manager: *TG Construction, Inc.*
- Commissioning Authority: *CTG Energetics, Inc.*

Project Team

(continued)

- Mechanical/Plumbing Design-Build Engineer: *Xcel Mechanical*
- Electrical Design-Build Engineer: *Dyna Electric*
- Landscape Architect: *IMA+Design*
- Civil Engineer: *AEI-CASC*
- Structural Engineer: *Ajit Randhava and Associates*
- Sustainability Consultant: *CTG Energetics, Inc.*

Water Quality-Stormwater Treatment Perforated Piping System

The site has been graded to create an onsite retention basin with a capacity of approximately 76 acre-feet. It is estimated that the site could retain up to a 25-year storm event with a controlled release of 80 cfs.

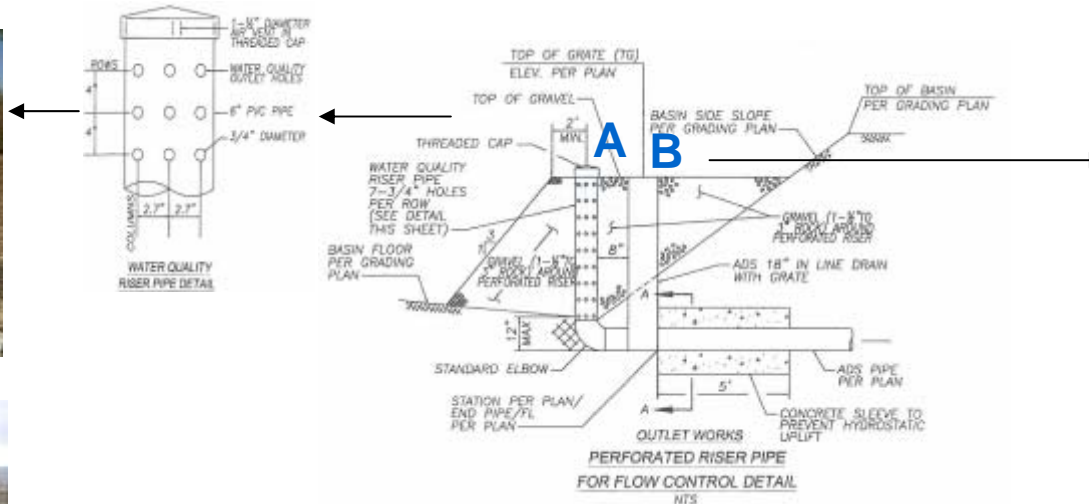


A

Stormwater from roof drains and onsite surfaces are filtered and treated before entering the storm drain system



B



All storm drain pipes on-site discharge into the channel and pond between the buildings.



Innovative Design

Conventional vs IEUA HQ

IEUA's Savings: \$1,417,322

Channel



Conventional

IEUA HQ

Curb & Gutter



Conventional

IEUA HQ

Stormdrain



Conventional

IEUA HQ

Stormwater Construction Costs

\$3,244,472

\$1,827,150

Estimated
Conventional

Actual
IEUA

Landscape



Conventional

IEUA HQ

Water Quality-Stormwater Treatment Biofilters and Detention Pond

Using biofilters, a detention pond, and appropriate plant materials, the site detains and treats up to a 25-year storm event.

Biofilters are Best Management Practices (BMP) consisting of dense vegetation designed to filter runoff. There were two types of biofilters used on the Agency Headquarters serving as pretreatment for the infiltration/retention basins.



- ◆ Bioswales are grass-lined broad channels that convey concentrated storm flows. They are characterized by a pollutant removal efficiency of 20 to 50 % for Total Suspended Solids and Total Phosphorous.



- ◆ Biostrips, which are grass-lined broad surface areas that produce a sheet flows. They are characterized by a removal efficiency of 40 to 90 % of Total Suspended Solids and 30 to 80 % of Total Phosphorous.



- ◆ Flows from on-site surfaces and roof drains are filtered through bioswales and biostrips then they are conveyed to a detention pond.



- ◆ A detention pond is a low lying area that is designed to temporarily hold water while slowly releasing flows to a different location.

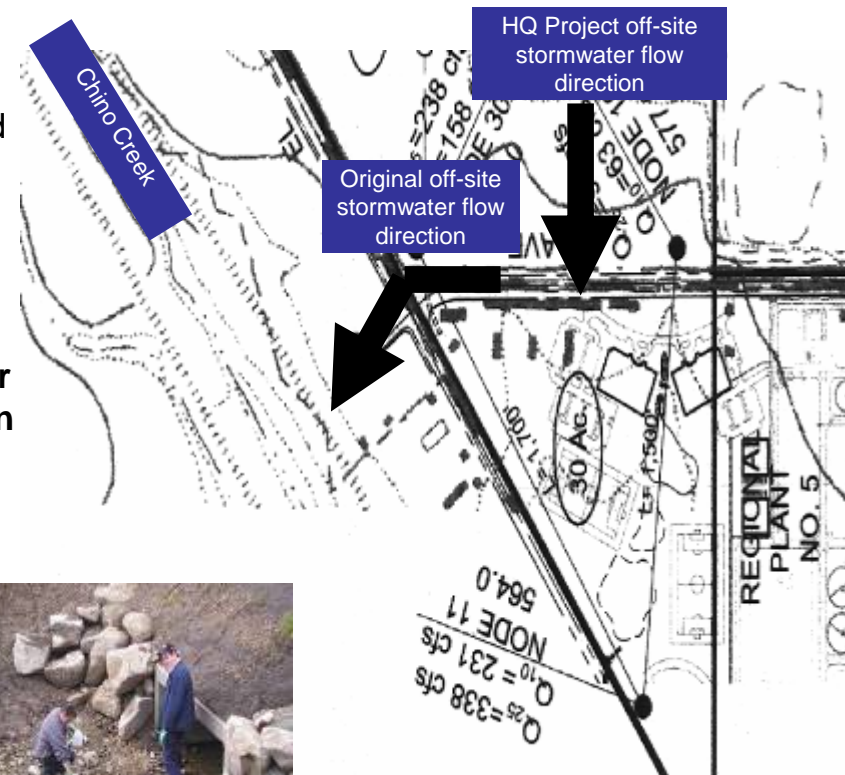


Water Quality-Stormwater Treatment

Actual Storm Event

Chino creek water quality is improving because of projects like this!!

On February 3, 2004, a major storm event occurred. IEUA sampled the stormwater (collected from the 700 acre watershed north of Kimball avenue) that flowed into the channel between the IEUA HQ. Prior to the implementation of this project this stormwater flowed directly into Chino Creek. Thirty (30) constituents were sampled (this is stormwater that comes from off-site, not from the HQ site) at the box culvert under the road and then again in the settling pond. **IEUA determined that over 90% removal was achieved using the channel and detention pond for several of these constituents.**



Water Quantity-Stormwater Flows

Reducing Impervious Surfaces

Our developed site detains more stormwater than before construction!!

- ◆ 60 % of the parking areas have permeable surfaces, which not only decreases impacts on infrastructure, but also reduces stormwater flows.



- ◆ The site's pavement design adheres to reducing the heat island effect with high albedo paving and employs 5 pavement materials – porous concrete, pervious pavers, decomposed granite, concrete, and asphalt. The use of permeable surfaces for the parking areas allow storm runoff to infiltrate into the ground, thus providing additional stormwater treatment and improving water quality.

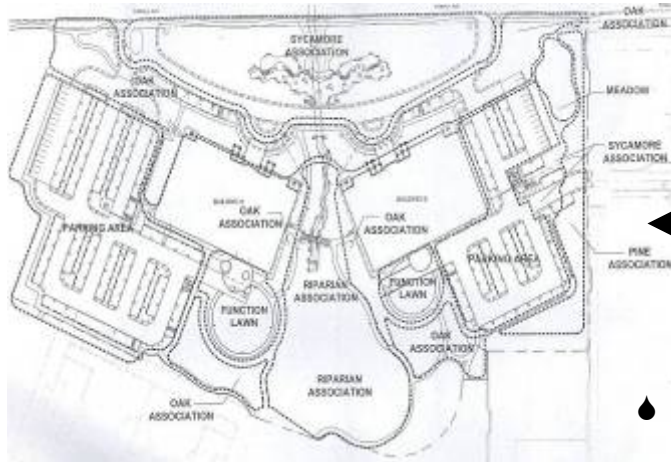


If the water has infiltrated, there is no need to treat it!

Water Conservation

Native and Drought Tolerant Plants

Recycled water meets 100% of the demands of on-site irrigation. Potable water demand is 73 % less than a comparable facility!

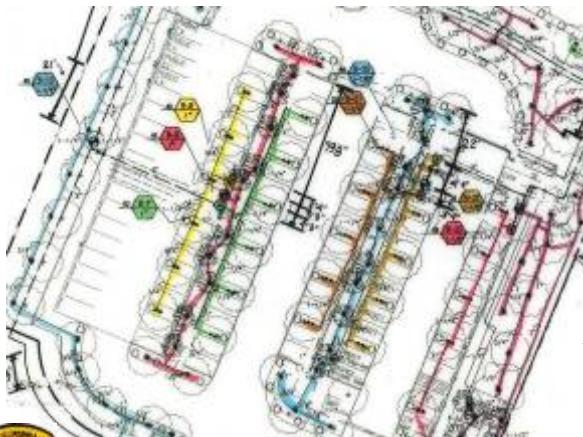


- ◆ The site has over 10,000 plants and over 100 different types of plants. This includes 19 different trees and 85 different shrubs.

The site has been divided into 5 zones or “associations”. Based on the association, specific types of plants can be located. To water all of these plants, the irrigation system has been divided into 138 zones, each with their own watering schedule. This allows irrigation system flexibility so that the plants are not over- or under-watered.

- ◆ More than 500 trees were planted on-site. No trees planted on site were larger than 15-gallon! This provides a healthier plant and saves significant project costs.

- ◆ Staking ties are loose for a healthy and strong tree trunk.



In this picture there are 8 different watering schemes. Each color represents a different watering scheme. This means that based on the different plant needs, 8 different watering schedules are set up in the irrigation controller.

Energy Conservation FLOOR HEATING SYSTEM

Heated recycled water conducted underneath the tiles is used to heat several areas of our facilities, decreasing the energy demand



Floor heating system control panel



Reception area of Building A and B



Locker room and shower area in restrooms

Energy Conservation

PHOTOVOLTAIC PANELS (PV)

The majority of energy supplied to building A, including the board room, is renewable energy from PVs. This comprises 24% of the total energy used in our facilities.



Five different manufacturers have provided 12 different photovoltaic panels.

On Building A's roof, there are:

Two 20 kW panels

Ten 2 kW panels



- ◆ This research project will be evaluating these panels side by side during a 12 month period to establish the most energy efficient panel and to determine manufacturer power production claims.
- ◆ A website which documents the continuous monitoring of these panels is located at:
 - ◆ <http://pierminigrid.showdata.org/equip/largesys.cfm?IdSite=47>



Partially funded by California Energy Commission

Recycled Materials

RECYCLED CONTENT

Our site has achieved a 90 % recycled content value overall



- ◆ Bathroom partitions and tire stops are made from recycled milk containers
- ◆ Crushed toilets (the high-water consumption type) are used instead of rock under the building foundation
- ◆ Bathroom tiles are made from car windshields



- ◆ Fly-ash (a waste material from ground or powdered coal) is used in the building concrete (10% in the walls and 30 % in the foundation)



- ◆ Recycled tire materials as crumbled rubber were used in the landscaped areas,
- ◆ Car stops were made of 100% post-consumer recycled tire rubber
- ◆ Recycled carpet, countertops, and linoleum were used within the New Headquarters Buildings.



- ◆ Picnic benches and tables are made of 40% rubber.



Partially funded by the California Integrated Waste Management Board