[inside]OUT
environment and education as one

a senior thesis by
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Typology: landscape design

Site: Channel Islands High School (CI) in Oxnard, California (alma mater, class of 2010)

Concept: The flow of water, people, and ideas.

Mission: Reduce water consumption and improve outdoor spaces.
DATA COLLECTION

The following elements are site inventory concerning site basics and water consumption. These are the building blocks that revealed the site's context, opportunities, and constraints.
I started my site inventory by taking photos of the school (below). Although I spent four years walking these halls, I had to assess the outdoor spaces through a new lens. With the design knowledge I have gained in my past 5 years at Cal Poly as a landscape architecture major, I saw my high school anew. CI is pretty much how I left it, but in a new context of severe drought. With this new perspective, I sought to design new open spaces that reflect daily student circulation and programs.

Next, I researched water data. In addition to volumes of water consumed, I mapped the hard and vegetated surfaces to see where infiltration was inhibited, and so on. Furthermore, I looked at the active water restrictions in Oxnard against those of nearby cities. Finally, I obtained a document on CI's current conservation efforts—a Landscape Water Use Report. I hoped to lay out all the existing conditions against my vision for the school and see where to fill in the gaps.
Here, the bits and pieces from the previous section come together as they are visualized, interpreted and analyzed. As a result, patterns were revealed that helped focus my project.
The next tier in my design process was to start layering data to create visualizations. By representing the site inventory graphically, I was able to gain insight into what kind of design interventions I should pursue. For example, the top right graph was my first eye opener. It compares CI’s 2013 water consumption on two levels. The left halves of the circles represent irrigation and domestic water from January to December. The right halves of both circles are the amount of rainwater the site would collect from roof surfaces over a year. As a result, I was able to see just how much more water was used for irrigation. Moreover, it’s evident that rainwater harvesting would not make a dent in irrigation while it would be closer to offsetting domestic water. Underneath is a volumetric visualization to further highlight the difference.

Below is a graphic showing the existing landscape for the Quad, the central plaza of campus. I layered the planters/obstacles with the circulation nodes that get the most pedestrian traffic. Consequently, I saw a discrepancy between the most efficient pathways and the orientation of the planted areas.

CIHS water consumed and collected on roofs over one year

1 bar = 100 CCF
(hundred cubic feet)
The aforementioned analysis is synthesized with my new ideas to produce my senior thesis.
My primary motivations are user-based design, the water cycle, and the state-wide drought. In focusing on the Quad, I used a connection of the circulation nodes to create the new pathways and outdoor spaces. I also added more shade trees and seating for students to use. At the same time, I wanted to allow for multi-use for the extracurricular groups and various events hosted on campus. The planted areas also serve more than one purpose. They will be used to educate on water-wise, site-specific planting. My proposed Quad features 34% less irrigated area.
How can a water-conscious design benefit Channel Islands High School?

**Educational Opportunities**
- Biology classes and environmental clubs can conduct experiments
- Outdoor spaces for demonstration, performances, or class on a sunny day
- Multi-use outdoor spaces
- Ways for students to connect with the landscape
- Space for expansion

**Low Impact Development (LID)**
- Mimics pre-development conditions
- Retains and treats stormwater on-site
- Allows rainwater to infiltrate through permeable paving, rain gardens, and bio swales
- Slows the speed of stormwater, lessening the impact of erosion
- Reduces pollution through filtering vegetation

Data Synthesis: [Inside-Out]

An example of an LID technique - the bioswale (Asakura Robinson Company, 2015)

Design Elements
- A - Area for future development
- B - Bioswales to collect stormwater
- C - Sports fields
- D - Rain gardens and seating
- E - The Quad with stage, seating, shade, and permeable paving
- F - Bioswale planters to catch parking lot runoff
DATA SYNTHESIS: [INSIDE]OUT

Section A - A'

Program Diagrams

- during class
- lunch
- passing period
- lunch rally

Class perspective from north-east
REFERENCES


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