

0.0.1

Barry Lehrman

M. Arch/M.LA '05

Architecture 700 Independent Thesis Proposal

0.1

I am proposing an exploration of urban infrastructure, with the Los Angeles Aqueduct as my site of investigation and intervention. My objective is raising the awareness of this umbilical cord, through exploring the paradox of the tenuous urbanity the aqueduct brings to the vast desert and mountains of California.

0.2

There is a rich legacy of engineering works/infrastructure that is worth reexamining and redefining through the filter of architecture. Architecture has the potential (without the overt use of graphics and language) to create a distinctive place by being a focal point in the greater landscape. The exploration of the cultural fallout of the Aqueduct (without which LA would be smaller than San Diego), is central to my creation of a significant system of architectural interventions along the route that accentuate the presence of the aqueduct.

1.0 INFRASTRUCTURE OF WATER

Cities have always been more than just a cluster of buildings - there have been major public works tightly tied to all historic cities that allowed them to thrive. The earliest cities emerged in naturally irrigated flood plains- Ur, Thebes, Damascus, and Mohenjo-Daro; at first water for drinking and irrigation was naturally sufficient. But as the population grew, new sources of water became imperative; irrigation ditches dug and the first wells sunk – the agricultural age was born. Rome would have remained a sleepy back water if the Tiber were the only source of water, so the construction of the Aqua Appia (in 312 B.C) marks the ascendancy of the empire and the spread of the city beyond the myth of Romulus and Remus. Great amounts of ingenuity have been applied to the diversion, capture and storage of water around the world, from the step wells in India, Inca canals, Hopi cisterns, and the dream of towing icebergs to Los Angeles – all to allow civilization in a xeric climate.

2.0 THE AQUEDUCT & THE CITY

Los Angeles (at least the European version) has always relied on irrigation ditches, and to provide water for its residents. The *Zanja Madre* (mother ditch) diverted water from the Los Angeles River in the Elysian valley to the Mexican residents of the Alta California city- by the late 19th century, the network and local population had expanded to the point of overdrawing the resources of the river and local aquifer. Looking north to the Owens Valley was a technological leap of faith and a cultural milestone for Los Angeles, which allowed the modern metropolis to emerge by providing ten times the water required by the population. Accompanying the construction of the Aqueduct is the noir stench of corruption and greed as the darker legacy of the Aqueduct. Resolving the issue of compensation for past injustices and environmental damage of the Owens Valley has only recently been addressed.

The aqueduct is the über river of Los Angeles - expanding the watershed and hinterlands 250 miles north to the Sierra Nevada and Mono Lake. As part of the political maneuvering to finance the original construction, the city of LA expanded its borders by annexing the San Fernando Valley and claiming most of the unincorporated area of the basin. As a result of purchasing the water rights from the Owens Valley ranchers, the Los Angeles Department of Water and Power became the 3rd largest landholder in the California after the State and Federal government (Owens Valley became a colonized territory to be exploited without representation). While the efforts to tame the flood prone Los Angeles River have resulted in a concrete lined ditch through densely populated neighborhoods - the Aqueduct runs through minimally settled areas, yet provides two of the required elements for the modern city: electricity and water.

2.1 TYPOLOGIES

0.0.2

Barry Lehrman

"Included in this work were 215 miles of road, 230 miles of pipe line, 218 miles of power transmission line and 377 miles of telegraph and telephone line. Fifty-seven camps were established along the line of work, most of them in the mountains, and good roads made to reach them." [*Construction of the Los Angeles Aqueduct-Final Report*, 1916]

The entire aqueduct system starts at the **intake** weir on the Owens River and at a similar structure above Mono Lake at the elevation of 6650 feet from sea level. Additional sources of water are the numerous wells tapping into the Owens Valley aquifer. The water then flows into an unlined canal before being stored in the first reservoir of the system.

There are two types of **canals/conduits** utilized - unlined and lined with concrete (with 135 miles of covered conduits). Unlike the Colorado River Aqueduct and the California Aqueduct (running along the western flank of the Sierra Nevada, connecting the Sacramento River Delta with San Diego) which are open-air and require pumping at several points; the LA Aqueduct has a down hill journey the entire way, which made it the first practical source for the city outside of the LA basin and local valleys.

Reservoirs are sprinkled along the path of the aqueduct wherever geology and geography create sufficiently enclosed valleys and basins. The reservoirs are primarily temporary holding basins with at most 80 days worth of storage capacity at full flow (compared to the Colorado River reservoirs that contain years of water). They are intended to moderate the daily and seasonal fluctuations, while providing for the four Hydro-Electric **power plants**, which are situated where there is a significant drop in elevation.

One hundred and sixty-four **tunnels** exist along the route. The drilling of these hard rock tunnels was the principle challenge (due to their length) in providing a downhill gradient for the entire length of the aqueduct. During the construction several records were established by the length of the tunnels and speed at which they were constructed.

Where the aqueduct encounters a valley, ravine or depression, inverted pressure **siphon** carries the water across the changes in elevations. These are the most distinctive elements of the aqueduct through the desert. Of the 11.4 miles of siphons along the aqueduct, the Antelope Valley Siphon is the longest at over 4 miles, and the Jawbone Siphon (8,095 feet long) has the greatest drop of 850 feet down and back up.

At the Castaic terminus of the aqueduct in the San Fernando Valley, there is a dramatic **cascade** (starting at an elevation of 1465 feet), dropping the water down to the San Valley floor (at about the 1060 foot elevation). Created to dissipate the force of falling water (for the overflow from the hydro-electric turbines), the cascades are the most visible and recognized element of the system, passed every day by thousands of drivers on the Golden State Freeway (Interstate 5) and made more famous by the movies such as Roman Polanski's *Chinatown*.

3.0 PROCESS

The process will zoom from the regional scale into the site specific; with the fall semester spent developing the specific pedagogy for the spring studio. Mapping the aqueduct and city are the preliminary steps, followed by analysis, and finally engaging one or more of the typologies with a proposed design. The dialectic discussions I will pursue are between function and meaning, site and theory, the sublime and the poetic.

The Situationist International provide one of the few useful theoretical frameworks for examining the role of infrastructure and the city. The *derive* and Guy Debord's concrete poetry of the city (literally and figuratively) are a potential tool for engaging the aqueduct. Derrida's deconstruction of the text fails to make the jump into the experience of place (even as Eisenman or Tschumi tried), and

0.0.3

Barry Lehrman

Deluze's obsession with smooth surfaces and cybernetic flows lack the tangible materiality that the Aqueduct demands. Michael Sorkin may hold some answers in bridging between utopian and the place of infrastructure. Additional readings will be pursued to define the theoretical basis for my thesis.

3.1 PROGRAM

The architectural program and scope is *not* to be predefined. Through the process of investigation, the emergence of issues that can be articulated will direct the program. The scale of the territory being investigated requires bold moves that can register over vast distances and yet invite the lingering and continued experience of the chosen sites at the intimate individual level.

Issues of sustainability is a chronic subtext to water use in the American West, as climatic changes and the growing population strain this vital resource. The utilization of locally occurring materials is one avenue of exploration that deals superficially with sustainability. Taping into the aqueduct to create a new microclimate can be a radical inversion of the transference of water – though who and what would benefit from this move? These issues and more will be the focus of my analysis.

Tourism emerged as the new economic engine for the Owens Valley after the agriculture base was usurped and dried up by the aqueduct. Providing facilities and attractions for the traveler are also potential line of inquiry. The converse approach would be to find a mechanism that telegraphs the Aqueducts presence and negates any requirements of being in the proximity.