

**FIRST
FLUSH** Filter
reducing parking lot runoff contaminants



Agri-Prop: A University of Houston graphic design / architecture collaborative project

Agri-Prop is derived from Agit-Prop, a form of political propaganda used during the Russian Revolution to inform, influence and mobilize public opinion. This propaganda was displayed on large street art pieces applied directly to mobile structures such as trains. Along with imagery, the works were covered with slogans and iconography.

Our Agri-Prop also serves to inform, influence and mobilize the public, though its message is ecological in nature (not communist). The Agri-Prop marries a mobile structure with a Houston specific ecologic problem and promotes a solution. Additionally, it incorporates plant material in to the basis of its structure.

The First Flush Filter is an Agri-Prop conceived of and built by a team composed of one graphic designer and three architects from the University of Houston.

Designer:	Kathryn Kelley
Architects:	Raven Bell
	Blake Krause
	Brad Naeher
Facilty Guidance:	Cheryl Beckett
	Patrick Peters

Introduction

Project

Research

Agri-Prop Artifact

Site Survey

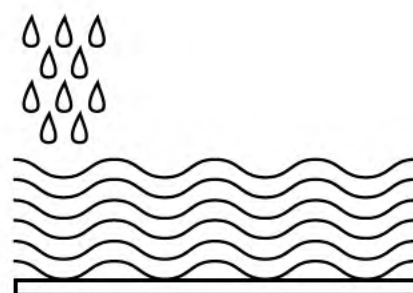
Justification

Fabrication

Deployment

Conclusion

Bibliography



Houstonian, very much dependent on the car, commutes 15,500 miles annually within the city. Daily they take as many as 4.5 motorized trips. 3 Paved roads and parking lots comprise 29% of the total surface area—that is approximately 620 square miles of impervious pavement. Three hundred and forty eight square miles of that is designated for parking. Rooftops cover 21% or 458 square miles. 1 Impervious surfaces cover as much as 50% of Greater Houston. The average annual rainfall is 44 inches. This combination of impervious surface and rainfall results in large quantities of stormwater runoff. This stormwater runs along the paved surfaces picking up sediment, oils and grease, heavy metals, debris and fertilizers and carries them to Houston's bayous and coastal waters. Our water has become unfit to drink, to come in direct contact with, and aquatic organisms from these waters should not be consumed. Flooding is a constant problem.

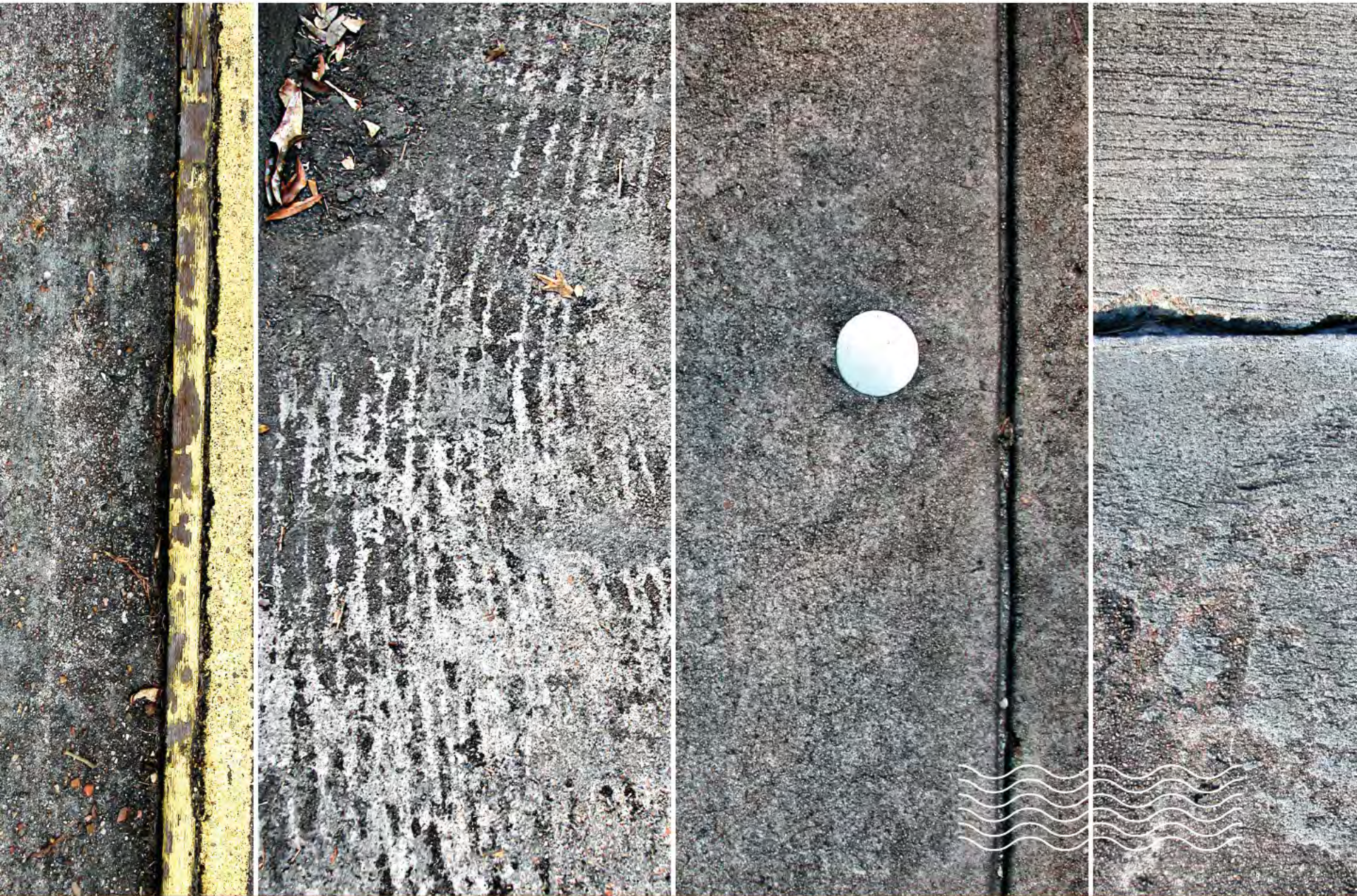




local bayous

FLOODING POOR WATER QUALITY

resulting from urban stormwater runoff



RESEARCH

Identify Houston specific ecological PROBLEM resulting from urbanization.

urbanized areas = impervious surfaces

impervious surfaces = nonabsorption of rainwater

nonabsorption of rainwater = increased volume of surface runoff

increased volume of surface runoff + hard smooth surface = increased water velocity

increased water velocity = increased load carrying capacity + reduced absorption capacity

increased load carrying capacity + reduced absorption capacity + surface contaminant = impaired water

$$\text{URBAN STORMWATER RUNOFF}^* = \text{[Swimmer in water]} \text{ [Faucet with water drop]} \text{ [Dish with fork and knife]} \text{ [Person in water with waves]}$$

large volumes of impaired water traveling at high volocities enter local waterways = lose of aquatic life + streambed erosion = incapitated

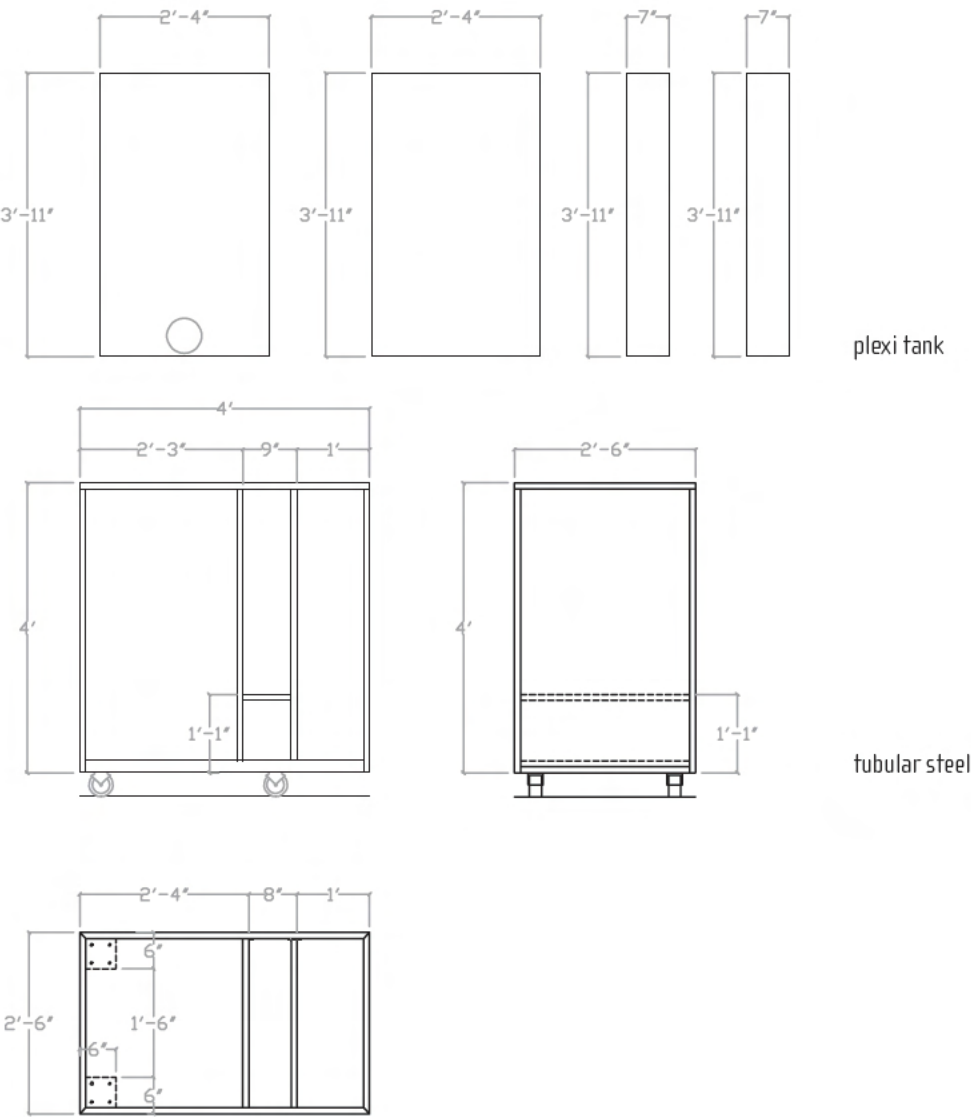
Determine viable solutions to alleviate problem.

waterways incompacitated waterways = flooding

* plus industrial excrement

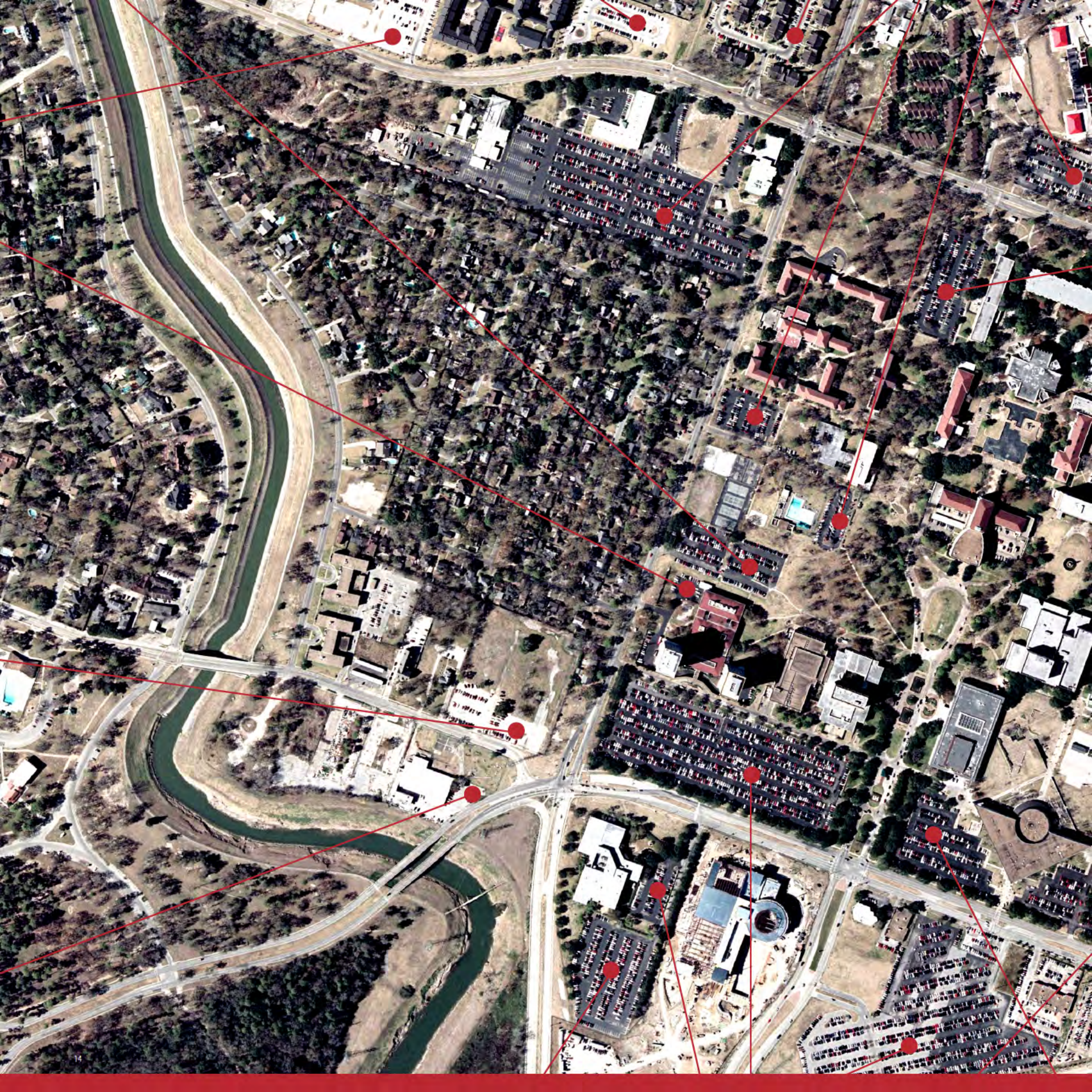
PROJECT

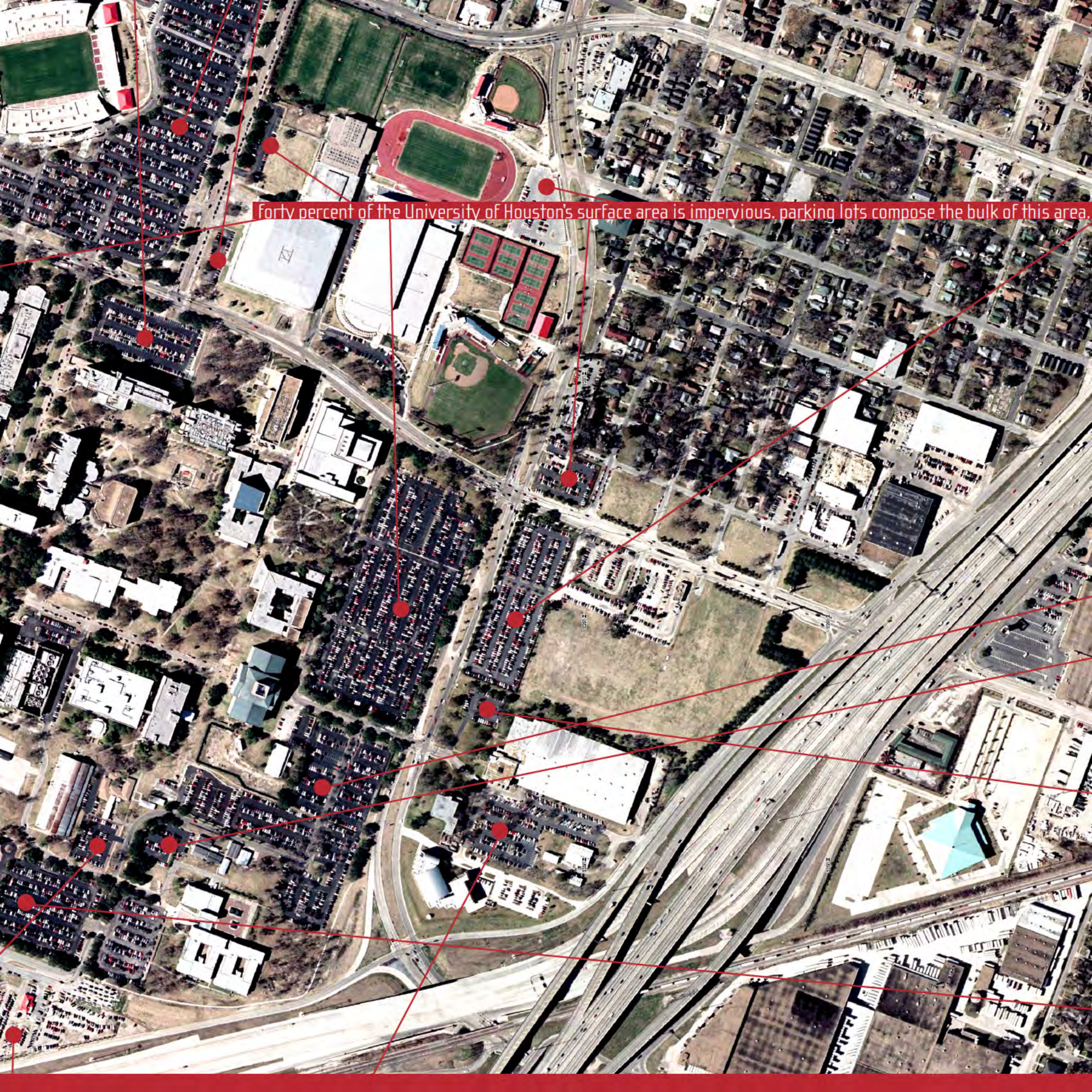
Devise a mobile artifact that incorporates a bio/hydro-mimicry system. Use this artifact in conjunction with appropriate eco information to promote this method in alleviating Houston's flooding and impaired water problem. This artifact will be placed in a public space allowing it to function to inform, influence and mobilize public opinion.



The artifact mimics the use of bioretention greenspaces and a porous parking pavement surface. A transparent material encases the rectangular core of the artifact. Above this tank-like case is a ramped area representing parking lot pavement. Within the tank, seated close to the base, is a perforated drainage pipe; it extends through the side of the tank. A layer of coarse gravel overlays the pipe and covers the entire interior base surface to a depth of 12-inches. The gravel layer is topped with 18-inches of sand. Just above this sand layer is a bioretentive soil mixture. A 6-inch layer of mulch caps the system. Native plants appropriate for bioretention and toxin absorption are planted in the soil. A strip of grass may be added to provide a border between the bioretentive plants and the pavement or slatted curb. The supporting information about bioretention for the purpose of flood mitigation and water quality control is silk-screened onto various surfaces of the artifact.

AGRI-PROP





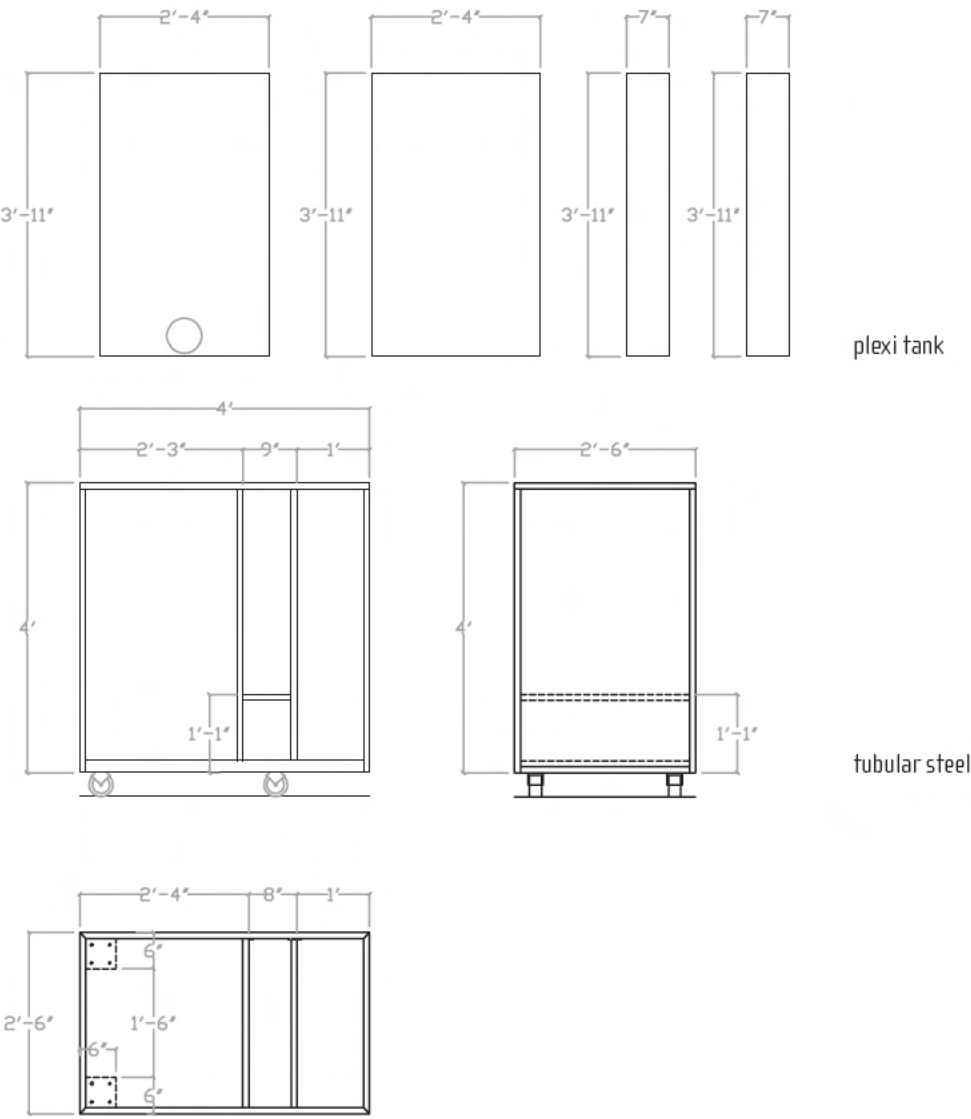
Forty percent of the University of Houston's surface area is impervious, parking lots compose the bulk of this area.





PROJECT

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- 1 dig 4' trench
- 2 add 8" gravel
- 3 place perforated pvc drainage pipe
forwards to curb and storm water system
- 4 add 4" gravel
- 5 add 18" medium coarse sand
- 6 add 6" soil mix of sand, peat, topsoil
- 7 add 6" mulch
- 8 add native plant life border with grass

