



BETTY
AND
CLINT
JOSEY
PAVILION

LEO, TEXAS

“Our ranches show how cattle can be part of a healthy ecosystem. This pavilion achieves the same ecological equilibrium, making it an ideal place for people to appreciate the land and watersheds that sustain us all.”

—*Robert J. Potts, President and CEO
Dixon Water Foundation*



Betty and Clint Josey

THE BETTY AND CLINT JOSEY PAVILION

project consists of two buildings of the same size that are connected by a shared gutter. One building houses the herbarium, restrooms, and kitchen, and the other building houses the education pavilion. The two buildings form a central gathering space around a large existing Live Oak tree and are situated to capture the cooling summer breezes and block the cold winter winds.

THE DIXON WATER FOUNDATION promotes healthy watersheds through sustainable land management to ensure that present and future generations of Texans have the water resources they need. To this end, the foundation demonstrates environmentally and ecologically sound ranching practices on its four properties in north and west Texas, in addition to funding grants, hosting educational events, and partnering with researchers.

As a Living Building, the Betty and Clint Josey Pavilion physically embodies the foundation's mission. Located on its Leo Unit in Cooke County, the meeting and educational event space provides a perfect setting for learning about natural resources and how good land management can conserve them.

"Like our livestock, this pavilion works in concert with nature," says Robert Potts, the foundation's president and CEO. "On our ranches, we use cattle to restore the land and create healthier watersheds. A Living Building

brings those goals to life in another way."

On Dixon Ranches, livestock emulate the natural symbiosis between grazing animals and grasslands. Cattle are rotated between small pastures in a way that mimics the grazing habits of North America's native herbivores, such as bison. This type of grazing creates more vigorous plants, enhances soil quality and biodiversity, and allows more rainwater to penetrate the ground, replenishing aquifers, creeks and rivers.

Such sustainable grazing methods can help with many environmental challenges facing Texas, which leads the nation in cattle production.

"Our ranches show how cattle can be part of a healthy ecosystem," Potts says. "This pavilion achieves the same ecological equilibrium, making it an ideal place for people to appreciate the land and watersheds that sustain us all."





100%
ENERGY
GENERATED
ON SITE

100%
FSC LUMBER
OR
SALVAGED

100%
WATER
TREATED ON
SITE



THE LIVING BUILDING CHALLENGE™ is a building certification program, advocacy tool and philosophy that defines the most advanced measure of sustainability in the built environment.

The Challenge is comprised of seven performance categories called Petals: **Place, Water, Energy, Health & Happiness, Materials, Equity and Beauty.**



SITE

100% of landscaping will be native prairie grass



WATER

100% of wastewater is treated onsite and returned to the natural water cycle



ENERGY

100% of energy is generated onsite. Passive, rather than mechanical strategies, provide occupant comfort



HEALTH

Testing has confirmed that indoor air quality almost indistinguishable from surrounding outdoor fresh air



MATERIALS

100% of materials were vetted for their life-cycles environmental impacts and their effects on human health. Only safe/healthy/low impact materials were incorporated



EQUITY

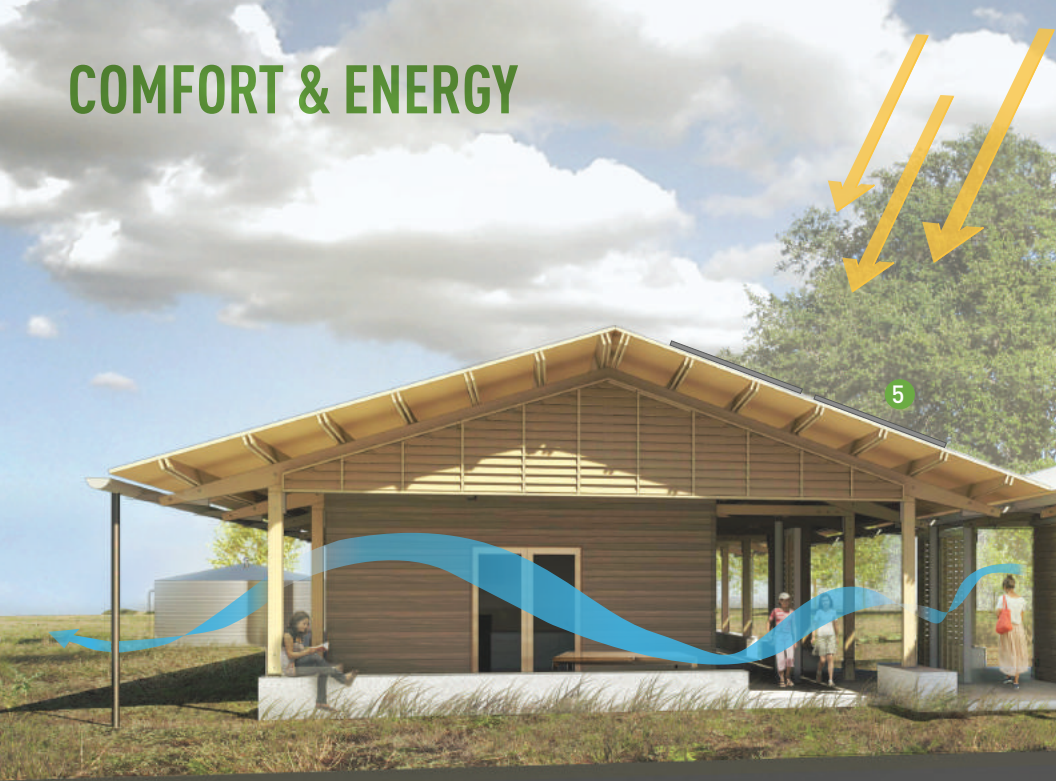
Both the program and the building were designed to benefit society by raising awareness for the local threatened prairieland



BEAUTY

Natural materials and human scaled spaces create a comfortable and tranquil environment that connects people with the landscape in holistic, non-intrusive way

COMFORT & ENERGY



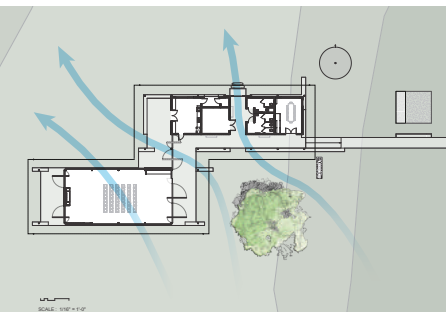
The Betty and Clint Josey Pavilion is designed to be comfortable year-round without the use of mechanical heating and cooling. In order to achieve this, the building was designed to be flexible and adapt based on the climatic conditions of any given day.

The two most important summer strategies for comfort in Texas are to capture the breeze and stay in the shade. The deep shady porches of the Betty and Clint Josey Pavilion

structures wrap around the north and west side of a large Live Oak tree, which provides shade and shelter for the central gathering space. Gapped wood doors at the edges of porches can be opened to allow maximum ventilation through this central gathering space and along the porches, which is oriented to capture the cooling **Summer** breezes from the southeast.

Other passive Summer strategies include:

- 1 Gapped wood doors can be opened to allow maximum ventilation through this central gathering space and along the porches, which are oriented to capture the cooling summer breezes from the southeast.
- 2 Glass pivot doors on the east and west of the pavilion can be adjusted to allow for the southeast corner to be entirely open and maximize the impact of the cooling breezes in the space.
- 3 The cupola perched on top of the roof not only provides daylight for the space, but also utilizes the negative pressure resulting from the breezes gliding over the



Summer



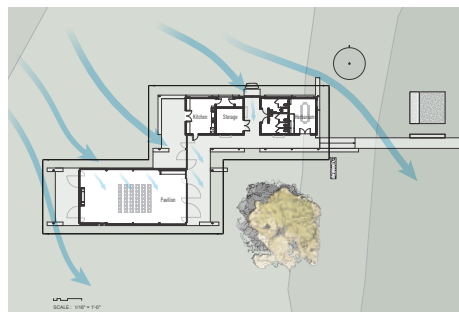
roof, which helps draw the hot air out of the pavilion and increases the velocity of the air moving through the space.

closed in the winter to help keep more of the warm air in and minimize air flow through the space.

The active systems that make this project include:

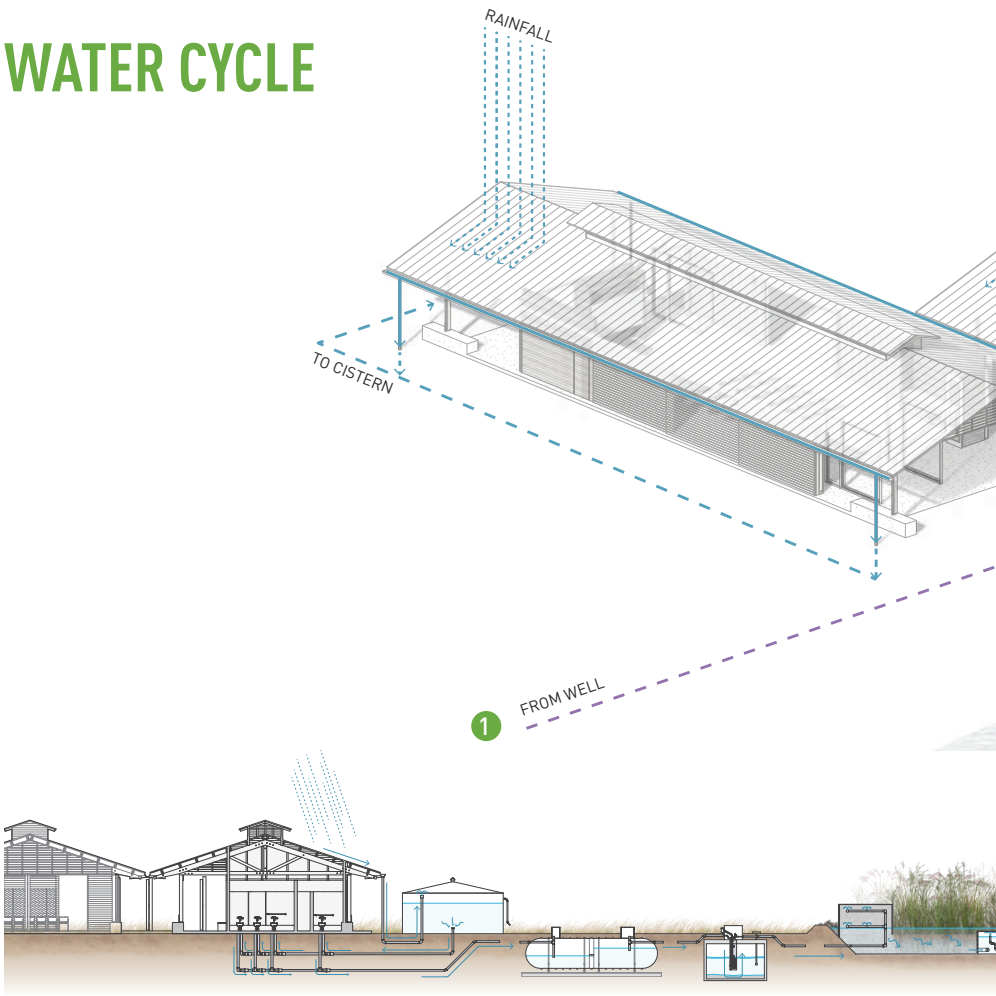
- 4 The large ceiling fans in the space supplement the natural ventilation and help keep occupants cool when the breeze is not sufficient.
- 5 The photovoltaic panels are mounted on the south facing roof and are projected to produce more energy than is needed to operate the building, making this a net positive project.

The building elements for the Betty and Clint Josey Pavilion are oriented to protect the courtyard created by the porches and Live Oak tree from the harsh northwestern winter winds. The doors at the edges of these porches help block the wind that would otherwise whip through the spaces formed between the buildings. The windows of the pavilion cupola are



Winter

WATER CYCLE

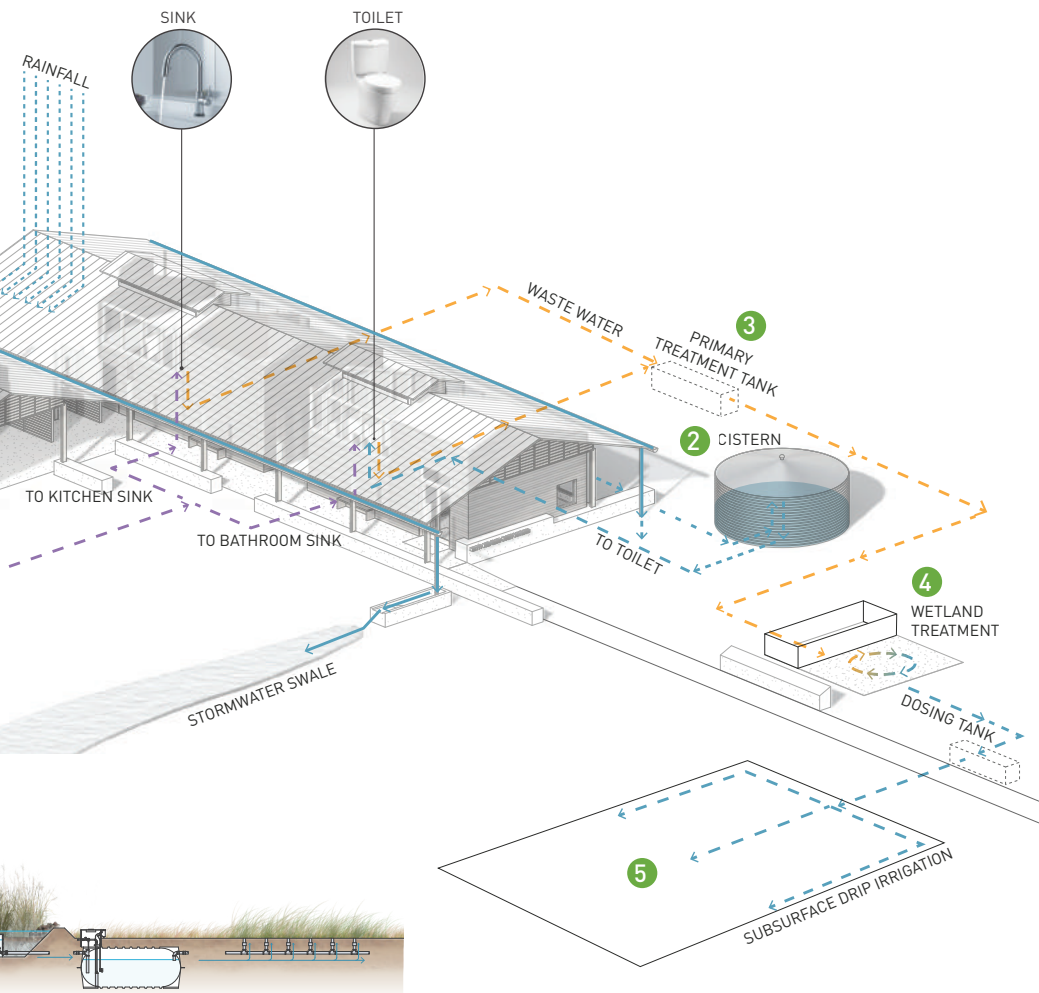


The Dixon Water Foundation's mission is to promote watershed protection through education. The Betty and Clint Josey Pavilion acts as a demonstration tool for how to mitigate the negative effects of waste water and storm water from a building by collecting the rainwater, by using a constructed wetland to cleanse blackwater, and by using site elements such as swales and berms to capture the excess storm water that then percolates back into the land without negatively affecting the watershed. The water from the site finds its way into the aquifer below, which provides the well water used for potable water purposes in the

kitchen and bathroom sinks, and the cycle continues:

- 1 The potable water going to the kitchen and bathroom sinks is provided by an existing well drawing from the Trinity Aquifer, which is located directly below the project site.
- 2 The rainwater that is collected in the 13,000 gallon storage tank provides for 100% of the non-potable uses such as sewage conveyance and occasional irrigation needs.
- 3 Greywater from the sinks and blackwater from the toilets is then transferred to a series of storage tanks for initial filtration.

Typically a remote project would use a standard septic system and leach field to treat the wastewater;



however, in sites such as this where, in most places, rock is found 8" – 12" below grade, septic systems are one of the leading causes of groundwater pollution because they do not effectively cleanse the excess nutrients from the wastewater.

- 4 The water then circulates through the constructed wetland several times and is cleansed by the roots of the plants growing within the wetland and the gravel that the water percolates through.
- 5 After the water has been polished, it is pumped to a drip field that completes the cycle and allows for the cleansed water to make its way through the earth and back into the aquifer.



MATERIAL SOURCING



When the carbon footprint of a building is calculated, one must consider the source of materials used to construct the building and compensate for a project's climate change related impacts associated with the construction process.

The Betty and Clint Josey Pavilion uses a simple palette of materials, which primarily consists of steel, wood, and concrete. All the wood siding and exposed framing is sinker Long Leaf Pine from the Gulf Coast region that was harvested in the early 1900s and sunk to the bottom of the river or bayou while being floated from the forest to

the mill. This old growth wood, which is far more dense and durable than wood harvested today, has been well-preserved in water for nearly a century and is now being dredged up from the bottom of these waterways throughout the south.

Before the logs made their journey downstream, they were all branded so that the wood could be identified and catalogued at the mill. The companies that are now harvesting these logs use these brands to track each tree they pull out of the water. You can find one such log at the pavilion.



MATERIAL RED LIST The Living Building Challenge envisions a future where all materials in the built environment are replenishable and have no negative impact on human and ecosystem health. The intent of the Red List is to induce a successful materials economy that is non-toxic and transparent.

Throughout their lifecycle, materials are responsible for many adverse upstream and downstream environmental impacts including, but not limited to, illness and pollution; however, typically manufacturers do not provide a list of ingredients found in their products because these ingredients are seen as proprietary. Transparency of information and ingredients found in our building materials is vital in transforming the marketplace to where it is an advantage to declare all of the ingredients found in a product. For more information, please see **declareproducts**.



ASBESTOS

Known to cause mesothelioma



CADIUM

Can cause pulmonary disease, weakened bones, and cancer



CHLORINATED POLYETHYLENE

Generate toxics during manufacturing



CFCs & HCFCs

Both CFC and HCFC cause ozone depletion



NEOPRENE

Due to the carbon-chlorine found in the product, dioxins are created during fabrication, a dangerous poison



FORMALDEHYDE

A known human carcinogen



HALOGENATED FLAME RETARDANTS

Shown to cause developmental problems



LEAD

Internal exposure can compromise the nervous system



MERCURY

A toxin that hinders the senses and coordination



PETROCHEMICAL FERTILIZERS AND PESTICIDES

Can cause anything from destruction of skin, damage to the nervous system, cancer, and death



PHTHALATES

Increases the risk of breast cancer, diabetes, and birth defects



PVC

Contains vinyl chloride, a known human carcinogen



CREOSOTE, ARSENIC, AND PENTACHLOROPHENOL TREATED WOOD

Creosote can lead to skin cancer; arsenic is a known carcinogen; pentachlorophenol can compromise the liver and immune systems



DIXON WATER FOUNDATION
dixonwater.org

LAKE|FLATO ARCHITECTS
lakeflato.com

LINCOLN BUILDERS
lincolnbuilders.com

BIOHABITATS
biohabitats.com

TLC ENGINEERING
tlc-engineers.com

CMJ ENGINEERING
cmjengr.com