

Climate Justice in Architecture

Design centering both the environmental and social aspects of climate change.

Climate justice in architecture refers to engagement, advocacy, planning, and design that draw down emissions; build resilience and capacity; support human, cultural, and ecological health; and protect all communities in the era of climate change.

Committee on the Environment

AIA Knowledge Community



Louisiana Children's Museum, Aerial View
Image Credit: Kevin Scott

Louisiana Children's Museum

This case study highlights an exemplary architecture project that prioritized both environmental and social aspects of climate change in its design process, community engagement approach, and final design. It aligns with many aspects of the AIA Climate Justice in Architecture Taxonomy across the building, neighborhood, regional, and global scales.

Louisiana Children’s Museum

New Orleans, LA



Louisiana Children’s Museum, Exterior Porch and Cloud Installation
Image Credit: Kevin Scott

Summary

The Louisiana Children’s Museum (LCM) proudly identifies as a [social justice organization](#) dedicated to creating a “world where communities value children.” After welcoming visitors to their building in New Orleans’ warehouse district for two decades, the museum was flooded by Hurricane Katrina along with large swathes of the city. The trauma experienced by children and their families in the hurricane’s aftermath, coupled with ongoing disparities in educational attainment—particularly among children in low-income and BIPOC (Black, Indigenous, and People of Color) neighborhoods of the city—inspired the museum to relocate to City Park, a 1,300-acre urban park in the center of New Orleans. This move turned the museum into an educational resource supporting social and environmental resilience among Louisiana’s children and their families.

Project overview

BUILDING PROGRAM TYPE(S):

Cultural institution

PROJECT TYPE:

New construction

CONDITIONED FLOOR AREA:

56,000 sq. ft.

TOTAL USERS:

262,500 annual visitors

SITE AREA:

348,480 sq. ft.

NUMBER OF FLOORS:

2

PROJECT CLIMATE ZONE:

ICC Climate Zone 2A

PROJECT SITE:

Greenfield (Previously Golf Course)

PROJECT SETTING:

Urban

YEAR OF SUBSTANTIAL COMPLETION:

2019

COST OF CONSTRUCTION (EXCLUDING FURNISHING):

\$33,400,000

THIRD PARTY RATING SYSTEM:

LEED 2009 BD+C Gold

Project team

OWNER:

Louisiana Children’s Museum

ARCHITECT & INTERIOR DESIGNER:

Mithun (design lead and executive architect);
Waggonner & Ball (collaborating local architect)

LANDSCAPE ARCHITECT:

Mithun

MEP ENGINEERS:

ARUP

STRUCTURAL ENGINEER:

Thornton Thomasetti

CIVIL ENGINEER:

Schrenk Endom Flanagan

GENERAL CONTRACTOR:

Roy Anderson, Corp.

“Katrina and its aftermath foregrounded climate and environmental issues specific to the Gulf Coast as well as the profound educational woes in southeast Louisiana. So, in light of what we were seeing, LCM came back to the visioning table and said, ‘the new museum, already laser focused on early childhood education, needs to be bigger. It needs to be bolder. It needs to have greater reach. And, it needs to have a strong and intentional focus on the environment.’”

— Allison Stouse, former Project Director, Louisiana Children’s Museum



Louisiana Children's Museum, Collaboration with a Neighborhood Charter School during COVID
Image Credit: Crista Rock / Courtesy: LCM

Design Process

When Hurricane Katrina devastated New Orleans in 2005, the Louisiana Children's Museum was already planning a renovation and small expansion in the warehouse district, where it had been housed for two decades. The trauma experienced by the children and families it serves prompted the museum to expand its mission, offering holistic education that supports children's health and development—particularly for families living on limited incomes.

The design process began with years of community outreach, which intensified after Hurricane Katrina. The museum and design team engaged in five months of workshops to gather perspectives from a diverse range of children and families about the exhibits and overall museum design. Recognizing Katrina's lasting impact on children's relationship with water, the engagement process included "water journals" created by children and their families to help inform trauma-informed exhibits exploring the relationship between water and land in the Mississippi Delta.

The project team also included an expert involved in the Greater New Orleans Urban Water Plan, who was familiar with the neighborhood's

historic flooding risks and how the museum design could help mitigate them. The final design includes numerous exhibits that allow children to engage with the landscape and water play—including a cloud garden experienced by crossing a bridge over a marsh. A floating classroom also enables children to explore the lagoon in a safe and non-threatening environment.

In addition to engaging with the wider community, the museum convened a steering committee of specialists in childhood development from Tulane and Loyola universities, a naturalist from Louisiana State University, and professionals and community members from across New Orleans, representing different family cultures, traditions, values, and heritage. Over the course of two years, the committee provided regular input as the design took shape. The exhibit design was influenced by interviews with 24 grandparents from a range of backgrounds. Excerpts from these conversations are displayed in the museum lobby.

"A lot of people talk the talk about community engagement during the design process. But, it takes time, and it takes organization, and it takes rigor and devotion. You need to be able to not only bring people to the table, but also document their input and implement it into the design—in our case, that meant into our experiential exhibits, our building, and our landscape. So, Mithun, the architect, went away for a time while the museum and exhibit team engaged in this demanding work. When we brought Mithun back into the process, we had this whole other body of information that really worked to not only enrich the project but to also establish the foundation for a deep and meaningful collaboration ... between the exhibit team and the architectural team that resulted in a stronger project."
— Allison Stouse, former Project Director, Louisiana Children's Museum

Social benefits in New Orleans and beyond

The new museum is making a meaningful impact on children in New Orleans and beyond. Its success—reflected in annual attendance tripling compared with the previous facility—demonstrates the value of investing in early childhood education and cultural institutions. The Governor of Louisiana and the Mayor of New Orleans have publicly cited the museum as a successful model when approving increased funding for early childhood development. Additionally, a regional economic group survey has ranked early childhood development as the region’s top priority.

During COVID, the museum’s flexible design and indoor/outdoor educational spaces allowed it to host preschool and kindergarten students from Langston Hughes Academy. The charter school’s curriculum had a natural alignment with the self-directed experiential learning environment, based on the Reggio-Emilia approach.

The school’s student population faces a high risk of educational disparities: 98% are Black, 74% qualify for free lunch, and 94% live below the poverty line. After participating in the program, students scored 35% higher on standardized tests than the average score in three comparable charter schools and 44% above grade level. Teachers also reported a dramatic reduction in disruptive behaviors.

The success of the program inspired the New Orleans superintendent of schools to create outdoor classrooms across city campuses, integrating outdoor education into STEM and project-based learning curricula.

“During COVID, LCM served as a school for students from a local public school in a unique partnership. The pandemic created an immediate need for LCM to utilize the museum in a way we always envisioned it could be. The school had the whole museum to themselves every day. Their teachers were trained in how to use the exhibits to teach. It was a magical thing that came out of COVID.”
— Allison Stouse, former Project Director, Louisiana Children’s Museum

Project financing

Hosting the Langston Hughes Academy during COVID was partly a financial decision for the museum, as closing the exhibit space to the public cut off its main source of revenue. Temporarily relocating to the museum also increased costs for the school, including transportation, food, and student support. To offset some expenses, the museum secured a \$25,000 grant from a local foundation, covering four months of operational expenditures such as janitorial services, facility operations, exhibit maintenance, and educational support.

In the years since COVID, the building and landscape design have strengthened grant applications for both museum programming and larger community projects. For example, funding proposals to extend the museum’s Living with Water exhibit highlight how the integration of indoor exhibits and landscape design creates an immersive experience. At the city scale, the green infrastructure on the Louisiana Children’s Museum grounds contributed to New Orleans’ successful bid for a \$141 million grant through the 2015 National Disaster Resilience Competition.

“When we are applying for funding, we do talk about the indoor-outdoor space. We talk about how the building was designed, how the landscaping was designed, and how all of that goes together, and why were a prime location for this kind of experience to happen. That gives credibility to the application, because you have the optimal environment that helps to make that programming happen.”
— Louisiana Children’s Museum.

Essential climate justice design components include:

- 1. Responding to community needs, even when it requires major project changes:** After Katrina, the museum recognized that relocating to a park setting would better serve the educational needs of children aged 0–8 and play a unique role in educating all New Orleanians on how to increase their own, their neighborhood’s, and their community’s social and environmental resilience in the face of climate change.
- 2. Integrating environmental and social objectives into a single, cohesive design:** Designing the building in tandem with environmental exhibits resulted in a facility that offers layered services through a single set of design features. It not only educates visitors about water and the Mississippi Delta ecosystem but also protects the community from flooding and extreme heat, supports mental health and well-being through access to nature, promotes education and access to fresh, healthy food, and democratizes access to museum exhibits and services. The layout of spaces, indoor-outdoor visual connections, and passive design strategies—such as deep porches and outdoor rooms—support a wide array of social services, most prominently demonstrated by hosting a school at the museum during COVID.
- 3. Measuring the design and museum programming’s impact on visitors:** 83% of post-occupancy survey participants reported the museum promotes healthy movement. 83% responded that the museum enhances feelings of well-being. When asked, “What does the new museum communicate to visitors and the community?” participants responded, in part: “You are valued. Beauty is all around you.” “Children are important—their health, well-being, connection to the environment and one another.”

AIA Climate Justice in Architecture Taxonomy

Climate change creates new, and amplifies existing, environmental, and social challenges across the following seven themes or categories: social determinants of health, cultural connection to place, economic development without displacement, environmental justice, ecosystem health, climate change health and resilience, and decarbonization. The Climate Justice in Architecture Taxonomy centers both the environmental and social aspects of climate change and helps teams respond with an architectural design impacting the themes across three scales: building occupants, the surrounding neighborhood, and regionally and globally. The taxonomy aligns and connects with the AIA Framework for Design Excellence, which represents the defining principles of design excellence in the 21st century. The Framework is comprised of 10 principles and informs progress toward four outcomes—a zero-carbon, healthy, resilient, and equitable built environment.

Louisiana Children’s Museum addresses all three scales in the taxonomy, with particular emphasis on the building and regional/global scales.

Climate Justice Taxonomy	Impact of Design Features by Spatial Scale			Alignment with Framework for Design Excellence			
	Building	Neighborhood	Regional/Global				
 Social Determinants of Health				 Integration	 Equitable Communities	 Ecosystems	 Water
				 Economy	 Well-being	 Change	 Discovery
 Cultural Connection to Place				 Integration	 Equitable Communities	 Ecosystems	 Water
				 Economy	 Energy	 Change	 Discovery
 Economic Development without Displacement				 Equitable Communities	 Water	 Economy	 Change
				 Discovery			
 Environmental Justice				 Equitable Communities	 Water	 Economy	 Change
				 Discovery			
 Ecosystem Health				 Integration	 Equitable Communities	 Ecosystems	 Well-being
				 Change	 Discovery		
 Climate Change Health & Resilience				 Equitable Communities	 Ecosystems	 Water	 Economy
				 Energy	 Change		
 Decarbonization				 Energy	 Well-being		

Overview of AIA Climate Justice in Architecture Framework themes and spatial scales: Louisiana Children’s Museum. Source: Biositu, LLC



Louisiana Children's Museum, Eatable Garden and Outdoor Kitchen
Image Credit: Christian Runge / ©Mithun

Social determinants of health

Dedicating a wing of the building to wraparound activities that complement museum programming to promote income inclusivity:

City Park draws visitors from across the city and state, both of which have a lower median income than the national average. The median family income in New Orleans is 32% lower than the US national average (\$51,116 in New Orleans and \$57,852 in Louisiana, compared with \$75,149 in the US). One wing of the building provides space for local non-profits and academic centers like the Tulane Institute of Infant and Early Childhood Mental Health to provide social services—such as parenting classes, literacy programs, and local Head Start programs—without requiring admission to the museum.

Integrating outdoor classrooms that offer nature-based learning for all to promote income inclusivity:

In addition to the Museums for All (\$2 general admission for patrons with SNAP benefits) and Art for All (free admission to Louisiana residents every other month) initiatives, 47,000 sf of outdoor immersive exhibits are free to all City Park visitors—almost doubling the functional size of the museum, which includes 56,000 sf of conditioned space. Freely available outdoor exhibits include the Toddler Landscape, a wetlands exploration area, the Music Hummock, the Cistern and Runnel Water Play activity, Pelican's Perch, a floating classroom, and a labyrinth. Exhibits like the Edible Garden and outdoor kitchen contribute to regional efforts to reduce the food insecurity rate, which is 18.6% in Orleans Parish and 18.1% in Louisiana—over 30% higher than the national average of 13.5%.

Adding welcoming spaces and exhibits to promote cultural inclusivity: New Orleans is a culturally diverse city made up of neighborhoods with distinctly different characters. The overall population is roughly 2/3 black and 1/3 white. But, neighborhood demographics can shift dramatically. For example, of the three neighborhoods closest to the LCM, Fairgrounds is 48% black and 43% white, Mid-City is 2.2% black and 89.3% white, and Navarre is 11.3% black and 69.6% white—compared with 12.5% black and 66% white in the US as a whole. The architecture and exhibits at the LCM actively seek to celebrate New Orleans' diversity and build bridges of community connection across the distinctive neighborhoods that characterize the city. For example, the Welcome Porch at the front of the museum is open to all City Park visitors, regardless of ticket status. Just inside, the lobby displays reflect input from residents with many cultural backgrounds and contain quotes from grandparents that speak to a diverse array of children and their families.

Supporting holistic early childhood development by creating safe spaces to learn and commune with nature: Pathways and activity zones are designed to support child-led discovery and engagement. Deep windows—known as “kindows”—allow children to climb inside a window nook and view the landscape from a semi-private perspective.

Supporting mental health through the intentional use of daylight: The use of views plays a major role in improving visitor mental health, as described in the following quote from a post-occupancy survey: “Visibility to outside. Views are everywhere, planned brilliantly allowing maximum daylight, connecting us to the joy of children, connecting us to wildlife (pelicans are our favorites—they always perform for us), and the fog is magical.”

“If you are looking in New Orleans for places that are accessible and welcoming to everyone, New Orleans City Park is probably at the top of that list. So, to locate the museum there was really important for increasing access.”
— Allison Stouse, former Project Director, Louisiana Children's Museum

Centering trauma-informed design principles in the building, landscaping, and exhibits' engagement with water: The Fujiko Nakaya fog installation is integrated into a Mithun-designed bridge that leads children across the lagoon and into the west entry of the museum. The goal is to help support healing from trauma caused by hurricanes like Katrina.

Integrating universal design principles throughout the building, landscaping, and exhibits: With extensive ramps, the exhibits are designed to be fully accessible to visitors with mobility challenges, including small children in strollers and grandparents, many of whom act as caregivers. Mobility inclusion is also explicitly addressed in exhibits, such as a life-sized musician in a wheelchair in the Jammin’ House exhibit. Two of the three neighborhoods nearest the museum are home to a higher-than-average percentage of adults over age 65: 29.6% in the Fairgrounds neighborhood and 20% in Mid-City, compared with 16% in New Orleans and 16.5% in the US.

“It came across strongly that post-Katrina children had potential discomfort around water, or had seen water do some really powerful and damaging things. So, it was important to make sure there would be ways that children could engage with water in a non-threatening way—elements like the mist sculpture when they arrive and getting close at certain places to the edge of water. We wanted to make sure that water would be a comfortable and friendly part of the environment.”

— Rich Franko, Partner, Mithun

Supporting mental health and well-being through biophilic landscape design: LCM contributes to the higher-than-average exposure to parks and green space enjoyed by New Orleanians (90%, compared with 35% in Louisiana and 61% in the US). Major landscaping features at LCM, such as the historic live oak grove and lagoon, combine biophilic design elements with educational signage to support the mental health and well-being of all park visitors. By calling out the ways in which spending time in nature can alleviate conditions like depression, the signage contributes to city-wide public health efforts to reduce the higher-than-average prevalence of depression in New Orleans (26%, compared with 19.5% in the US) and could be particularly beneficial for residents of the nearby Mid-City and Navarre neighborhoods, where 27.7% and 28.5% of adult residents, respectively, are estimated to experience depression on a regular basis.

“The new LCM is set up in a way that the landscape and building are interwoven. The thing we want children to take away from the building and landscape would be a positive engagement around water and the environment, a sense of play and delight in these native landscape elements.”

— Rich Franko, Partner, Mithun (Curbed, 2019)

Responding to statewide disparities in educational outcomes: The museum’s emphasis on holistic childhood education is a direct response to Louisiana’s ranking as the 48th state (lowest 5%) in educational outcomes at the time of design.

Creating an equitable model for improving the health and well-being of low-income children: The museum’s holistic approach to early childhood development prompted its move from the New Orleans Warehouse District to City Park, shifting the focus of exhibits from indoors to connecting children with nature and educating them about ecology and resilience. The location in the park also made it possible to expand the museum’s reach beyond paying visitors to all park visitors.

Reducing chronic disease risk through education and access to physical activity and fresh, healthy food: Easy access to opportunities to be physically active and eat fresh, healthy food can reduce the risk of chronic disease. For example, a portion of the lower rates of diabetes and poor general health as well as higher rates of physical activity in the Mid-City and Navarre neighborhoods may be attributable to their location next to City Park: 8.5% diabetes, 12.4% poor general health, 84% regular physical activity in Mid-City and 7.3% diabetes, 11.3% poor general health, 84.3% regular physical activity in Navarre compared with 14.1% diabetes, 22.6% poor general health, and 73.3% regular physical activity in New Orleans. The educational outdoor space teaches children about the relationship between food and nature. It features an edible garden, outdoor kitchen, picnic tables, and a waterway that irrigates the plants. The museum café serves healthier versions of popular local foods using local ingredients, including from the on-site community garden. The kid’s culinary lab and an edible demonstration garden connect the food we eat with how it grows and is prepared. Activities include harvesting herbs and fruits and making meals at a shared table in the garden.

Welcoming local non-profits to program activities after regular museum hours: To expand access for children and youth beyond its target age range of 0–3, the museum provides spaces for local non-profits to run activities from 4–8pm. The museum further supports these activities by connecting them with educational content and skill building activities, offering exclusive access to relevant areas of the building and landscape.

“We know that once you open those lenses up, they’re never going to go back to the same size. So, we want to make sure that we give exposure to children on any careers that are associated with exhibits, the building, and anything displayed in the building. We want to make certain that we are highlighting those as potential opportunities for children to explore more.”

— Tifferney White, CEO, Louisiana Children’s Museum



Louisiana Children’s Museum, Indoor-Outdoor Ecological Exhibits
Image Credit: Kevin Scott

Cultural connection to place

Presenting a modern interpretation of New Orleans vernacular architecture: Vernacular design elements include the deep porch next to the lagoon and live oak grove, which provide shade and create conditions for a breeze on hot days. The interior courtyard is also a common feature in historic New Orleans architecture. The interactive glass spheres installation on the porch railings was inspired by the original glass Mardis Gras beads, and created by local artist Mitchell Gaudet.

Highlighting the importance of City Park to New Orleans culture: As described in the following quote from a post-occupancy survey: “Windows in boardroom overlooking lagoon, they perfectly frame what being in City Park is all about.”

Spotlighting diverse voices from across New Orleans: To explicitly connect the building, grounds, and exhibits to cultural touchstones in New Orleans, many local artists influenced the design elements. For example, Terrance Osborne designed a multicolored shotgun house exhibit, and Alex Beard painted a mural inspired by Louisiana natural landscapes. Children’s artwork and grandparents’ thoughts about local art are also prominently displayed.

Installing native vegetation and signage to highlight the park’s role in New Orleans culture: The Louisiana Children’s Museum is in a public park near other cultural institutions like the art museum and botanical garden. The museum’s landscape exhibits educate visitors on the historic elements of the site, which is one of the country’s oldest urban parks.

Designing the lagoon to maximize flood resilience: In the 1930s, City Park transformed brackish marshland into a manmade lagoon and canal system linking Lake Pontchartrain and Bayou St. John. The construction of the museum offered an opportunity to convert some of that “grey” flood infrastructure into “green” infrastructure while increasing awareness about the history of flood mitigation in the city.

Building awareness of the importance of the environment: Answers to a question in a post-occupancy survey about what the new museum communicates to visitors and the community demonstrate how the museum enhances visitor appreciation for the natural world. For example, one visitor wrote: “The importance of our local environment to our everyday lives.”

“There is a lot of what I see in design intent that is being actualized in the museum experience. Oftentimes when I’m touring adults through the building, one of the things they say is they understand the ecosystem better. They’ve been living in New Orleans. They’ve been living with the river and the port and the lakes, and somehow, seeing those elements in this building as well as the indoor and outdoor playing together or interacting together, engaging together, gives them a different picture.”

— Tifferney White, CEO, Louisiana Children’s Museum.

Economic development without causing displacement

Exposing local high school students to environmental careers and ways to increase resilience in their home neighborhoods: Museum programming uses the building’s green infrastructure to expose local high school students to potential career pathways related to environmental science that could benefit their home neighborhoods. For example, youth living in nearby neighborhoods like Fairgrounds, which combines moderately high rates of home ownership (46%, compared with 49% in New Orleans and 65% in the US), particularly for black residents (59.3%, compared with 48.7% in New Orleans, and 8% in the US) with exposure to a 100-year floodplain, can apply the skills they learn at LCM to help their families increase neighborhood resilience to flooding and protect their property value.

“We are talking with high school students about the hidden challenges that are visible in the museum building. They live in neighborhoods where the flooding is huge and they’re experiencing that. So, we’re trying to go from lived experience and then talk about the challenge. And use the museum building and landscape design to think about how we might be able to find solutions to those challenges, or at least be able to understand what’s happening so that they have that knowledge and education.”

— Louisiana Children’s Museum



Environmental Justice

Building regional awareness of flooding and water pollution and sustainable ways to address them: The museum’s exhibits and landscaping highlight pollution in the Mississippi River caused by upstream sources, while also showcasing green infrastructure techniques to reduce flood risk and clean the water before it flows into the Gulf.

“Water is paramount in New Orleans. It drives our economy. It drives our culture. It shapes the city geographically. It’s critical to our personal and environmental health. But, we have this balance of living with water as both an asset and a threat, a gift and a challenge. On the one hand, we have an abundant diverse landscape supported by our extensive wetlands. We have a robust port economy that connects us to the world. We have this amazing river that has inspired music and art and literature. On the other hand, we think every day about how do we live with all this water? How do we manage stormwater? How do we address pollution from all the industry upriver that flows to us. New Orleans is at almost the very end of the Mississippi/ Atchafalaya River Basin, so we receive whatever flows down from everybody above us. How do we address the incredibly rapid land loss that is making New Orleans more vulnerable to storms and eroding land, indigenous cultures, and ways of life? We sit at a dynamic intersection of inspiration, opportunity and peril.”
— Allison Stouse, former Project Director, Louisiana Children’s Museum

Ecosystem health

Maximizing the restoration of native ecosystems: 61% of the site (5 of 8.5 acres) is protected or restored native habitat.

Weaving indoor and outdoor spaces to enhances biodiversity education and ecosystem services: The sequencing of exhibits connects visitors to the surrounding natural systems, directing them through a grove of oak trees, across the lagoon, into immersive exhibits with choreographed window views, and finally outside to a sensory garden and edible garden/outdoor kitchen.

Building awareness and appreciation for ecosystem health through immersive and experiential exhibits: Child-led immersive exhibits transition from indoors to outdoors, featuring a mock-up of the Mississippi River and a floating classroom barge. 100% of respondents to a post-occupancy survey reported that the museum’s location in City Park, its landscape design, and the educational signage “enhance children’s connections to nature and the environment.”

Educating visitors on the transitions in the river delta ecosystem: Signage marking elevation changes, at every six inches, in the wetland along the bank of the lagoon educates visitors about the changes in ecosystems and the role each set of plants play in creating an overall healthy ecosystem.

Creating immersive experiences for children to imagine life in different parts of a massive live oak tree: The heritage live oak trees on the museum site, with their expansive root systems and horizontal branches inspired the design of indoor exhibit spaces, which create small spaces for children to play within large, expansive interior spaces.

“The exhibit designer, Gyroscope, Mithun, and the Louisiana Children’s Museum had a really great collaboration early on, so that when you’re up at the Mississippi exhibit, you look out on the lagoon and the water in the exhibit is connecting to the water outside the window. When you’re in the Dig into Nature exhibit, you see out into these vines that are growing up the building so that the inside and outside connect.”
— Rich Franko, Partner, Mithun

Restoring a native wetland habitat in a manmade 1930s lagoon: The landscape design maximizes biodiversity, replacing the steep banks of the manmade lagoon with 20-footwide shallow terraces planted with wetland species.

Attracting native flora and fauna back to City Park: Floating bio-islands are designed to attract nesting birds. Habitat logs support turtle, fish, and bird habitat.

Protecting nocturnal ecosystems: Lights are turned off at night to support the nocturnal ecosystem in City Park.

Southern Louisiana is “a place where water and land are constantly interwoven and interdependent.”
— Rich Franko, Partner, Mithun (Curbed, 2019)

Protecting the world’s largest grove of live oaks—a World Heritage Site: The building footprint and pier foundation avoid disturbing a grove of heritage oak trees that are of great historical and environmental significance to the region.

Safeguarding migratory birds through a curtainwall design: The building’s design supports native habitat through external louvers and bird-safe fritted glass to reduce bird collisions.

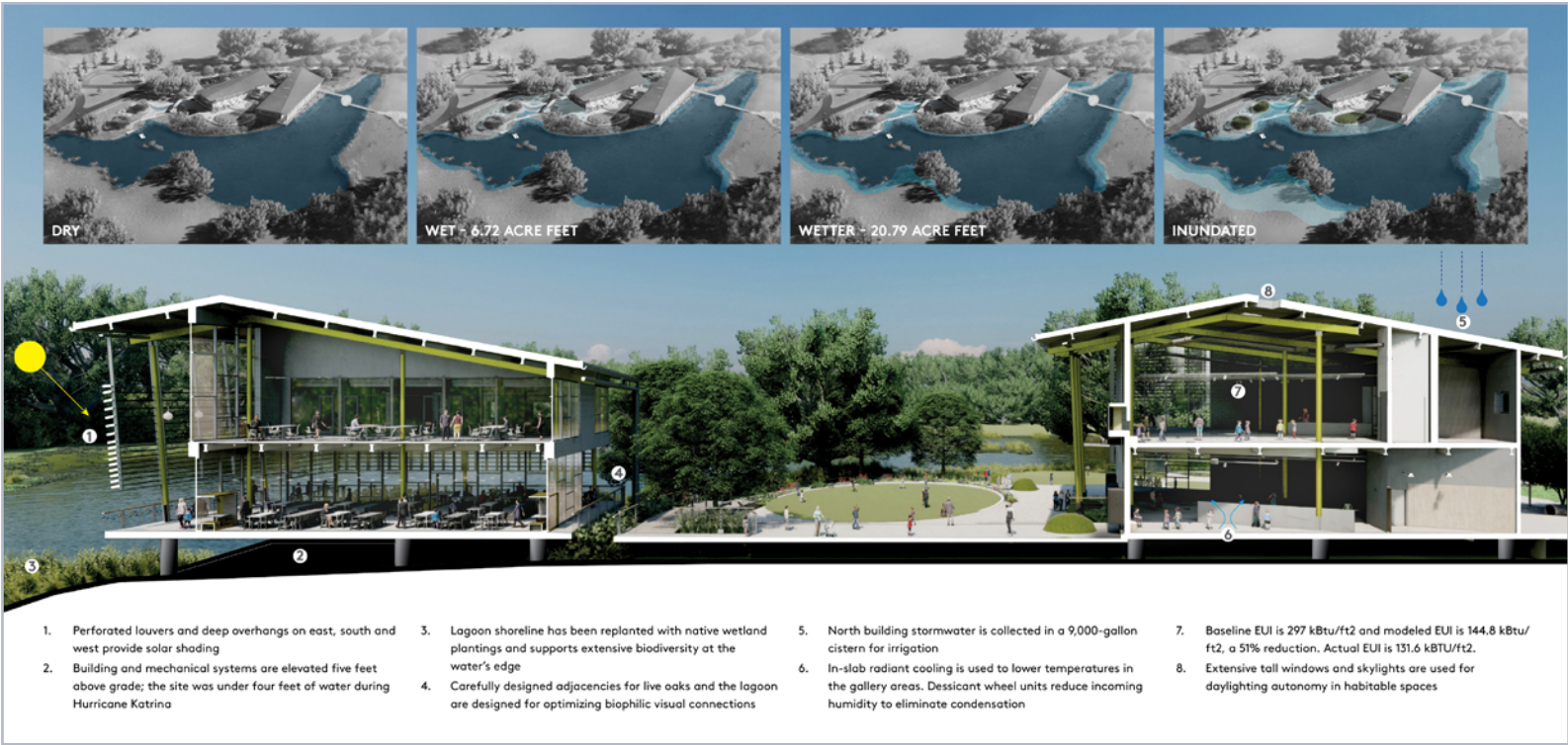
Climate change health & resilience

Enhancing social and environmental resilience by creating a building designed to be flooded: The site is located below sea level with no natural drainage. It is adjacent to a 1930s era manmade lagoon and canal system. The building is designed to withstand up to four feet of water without compromising the structure or primary walking paths. Critical building equipment is elevated five feet above ground level—one foot higher than flooding reached during Hurricane Katrina. A flow-through zone is located below the slab to reduce water pressure on the structure during flooding events. Educational signs are designed to teach New Orleans residents how to enhance their own homes’ resilience to flooding. Flood resilience measures made it possible for the museum to reopen quickly after five major flood events in 2020.

Enhancing resilience to extreme heat through passive design features: Perforated louvers and deep overhangs along a long porch and near the water body increase shading and airflow. Tall windows, skylights, window frits, solar louvers, and roller shades increase resilience to power outages by delivering daylighting without glare. Highly efficient wall insulation and light-colored exterior walls and roofing reduce occupant exposure to extreme heat.

Integrating practical climate resilience strategies into outdoor exhibits and play elements: Flood-related green infrastructure exhibits and play elements are interwoven with educational placards that teach museum visitors how to build resilience to flooding.

“The building has these very distinctive roofs and a vast gutter system. On one of the buildings, rainwater is collected in a giant cistern that is a contributor to the landscape irrigation and also an interactive water feature—water comes out of the lower part of the cistern into a basin where children can pump and splash and stamp their feet in it.”
— Allison Stouse, former Project Director, Louisiana Children’s Museum



Louisiana Children’s Museum, Design for Resilience
Image Credit: Mithun

Safeguarding facility operations during power outages: Building systems are connected to a central battery system and generator that will run for four hours.

Designing the roof to collect rainwater: The museum’s roof directs rainwater to a 9,000-gallon cistern. It teaches children about the water cycle, reduces flood risk, and stores water for irrigation.

Enhancing resilience to hurricane-force winds: Like all of New Orleans, LCM is at high risk of hurricanes. As a result, all glazing and façade elements were designed to withstand high winds.

Offering limited shelter from heat and flooding during daylight hours: The elevated courtyard and covered porches surrounding the building are available for outdoor sheltering during daylight hours. The interior courtyard is also available for limited sheltering. It offers additional security and access to restrooms whose toilets are supplied with emergency water from a 9,000-gallon rainwater cistern.

We have at the front of our building a room, the Entergy Charitable Foundation Talk & Play Center. It is available for anyone to use. It could be families that are in the park that just want to get out of the heat. We have story time in that space. And, there are early childhood organizations that come in and take advantage of the story time. Sometimes we customize those experiences based on what they’re studying in their classroom or what they’re doing with their students.”
— Louisiana Children’s Museum

Using the renovations to the manmade lagoon as a pilot for the Greater New Orleans Urban Water Plan: Neighborhoods surrounding City Park are located in the 100-year flood plain. To maximize the urban flood mitigation services provided by the park, the landscaping renovation turned the lagoon into green infrastructure that retains stormwater from surrounding neighborhoods and streets. It is designed to relieve pressure on the pump systems that drain most neighborhoods.

Mitigating nonpoint source water pollution from surrounding areas: Bioretention swales are designed to filter 80% of total suspended solids from parking and street runoff and treat 90% of stormwater runoff from an average rainfall. The system filters an estimated 1.7 million gallons per year of stormwater that would otherwise flow directly into the Mississippi and the Gulf of Mexico.

Expanding the definition of a resilience hub: Passive design features and abundant outdoor spaces provide refuge from heat and flooding, allowing the museum to be used as an ad hoc shelter during extreme weather. Its flexible design, combined with adaptable operations, enabled its conversion into a temporary school during COVID.

“The site is designed to be part of a stormwater receiving area for the surrounding community. That’s an example of adaptive resilience where it’s serving a broader community. If you have a generator, you’re up and running during a climate event, but that might not benefit a larger group unless you are acting as a community shelter. But, things like stormwater mitigation are actually serving the larger neighborhood and showing that everybody can be a team player with that type of green infrastructure design.”
— Rich Franko, Partner, Mithun

Decarbonization

Combining a desiccant wheel with radiant cooling to increase energy efficiency and improve thermal comfort: The mechanical design innovatively uses radiant cooling in gallery area slabs with desiccant wheels to reduce the humidity of incoming air. Tall windows and skylights reduce lighting demand by providing daylighting. The resulting design modeled an energy use intensity (EUI) of 144.8 kBtu/ft2 compared with 297 kBtu/ft2 in the baseline model (a 50% reduction). The actual measured EUI for the first year was even lower—131.6 kBtu/ft2.

“The approach to the design was always to create a building that would be a tool for learning. As young children or adults move through the building, at a height of 3’-6” or 6’-3”, they have these delightful interactions with the light, the structure, the sound and textures that are experiential in nature and demonstrative of the sustainable strategies that have been integrated throughout.”
— Allison Stouse, former Project Director, Louisiana Children’s Museum

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Contributors

COTE Knowledge Community and AIA Staff.

Special thanks

Louisiana Children’s Museum, Mithun, interview participants.

Additional information

2022 AIA COTE Top Ten Award. <https://classic.aia.org/showcases/6484213-louisiana-childrens-museum>

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Committee on the Environment

