Honorable Mention

AIA/COTE TOP TEN GREEN PROJECTS 2007

William J. Clinton Presidential Center

Location: Little Rock, AR **Architect:** **Polshek Partnership Architects**

OVERVIEW

The Clinton Presidential Center, located east of downtown Little Rock, is partially elevated, its bridge-like form both a reference to Little Rock's distinctive "Six Bridges" and a metaphor for the progressive goals of the Clinton presidency. Inside, a large, daylit exhibition space teaches visitors about the Clinton administration's initiatives.

Contrasting with the bridge building is the earthbound archive building, clad in stone and concrete. While the millions of documents and artifacts of the presidential archive are located in a secure, below-grade environment, the archivists occupy the light-filled glass and steel structure above.

This photo shows the elevated portion of the building from Rock Island Bridge.

Photo: Albert Vecerka

Full project profile:
www.aiatopten.org/hpb/overview.cfm?ProjectID=736

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Sustainable Design Intent & Innovation

The project is located on a remediated brownfield on the south bank of the Arkansas River. Outside, the project features a park that extends an existing chain of parks along the river. The site includes a grass amphitheater, a playground, and a seasonal festival grove as well as quieter, more naturally landscaped and restored riparian spaces. A sophisticated irrigation system and water-efficient plumbing fixtures reduce the project's use of potable water.

The project was designed to encourage alternative transportation. Bike racks, showers, and changing rooms are provided for bicyclists and joggers; the city's light-rail system connects to the site; and the parking lot reserves priority parking for carpool vehicles and buses and charging stations for electric vehicles.

The project's outer west-facing wall of glass has a screened interlayer that blocks 50% of the sun's light and heat and 99% of the UV rays. The interior environment features demand-controlled ventilation and radiant-floor heating and cooling. Extensive daylighting, energy-efficient electric lighting, and a building-management system further improve the project's efficiency, and a 50-kilowatt photovoltaic array produces electricity on site. Materials were selected for their regional availability, recycled content, rapidly renewable content, and low chemical emissions.

This photo shows the building and park from across the highway at night.

Photo: Timothy Hursley

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Regional/Community Design & Connectivity

The original site was an underused industrial area, a portion of which had been contaminated by diesel fuel storage tanks and asbestos. The asbestos abatement required for any renovation or demolition of the vacant buildings had impeded development for many years.

The project site was chosen with the goal of transforming a derelict industrial site immediately adjacent to the city's downtown River Market District into a museum and research center with 30 acres of public park space. The project is integrated with larger planning projects and provides pedestrian connections across the river to future development areas.

The project does not represent a significant development density because of its park space; the site was selected to channel development to the River Market District, however, which has a development density in excess of 60,000 ft^2 per acre. Since construction began on the project, the River Market District has given rise to mixed-use development including a hotel, an office building, condominiums, apartments, restaurants, and shops.

The site was also selected because of its proximity to the city's primary bus terminal; 28 bus lines stop within a half-mile of the museum, and a light-rail trolley stop is planned for within 600 feet. Although local regulations initially required 704 parking spaces, the design team worked with authorities to reduce the required number to 369, or one space for every 3.3 people. Public parking areas include spaces dedicated to high-occupancy vehicles, and the staff parking area includes preferred carpool spaces.

The project promotes community and a sense of place by offering outdoor areas for celebrations, theatrical performances, and educational use as well as for picnicing, strolling, bird watching, and nature study. An outdoor area also provides wireless internet access. The sculptural landscape features an amphitheater, a playground, an arboretum, and promenades along the reconstructed revetment.

Use other transport options: 35%

Parking spaces per person: 0.30

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Land Use & Site Ecology

Addressing the project's site ecology began with removing diesel storage tanks, abating asbestos in several buildings, and cleaning up the waste from illegal dumping. The project team removed contaminants and remediated the site according to state and federal regulations.

Reconstructing the revetment and protecting the riparian habitat along the river's edge were key components of the project. The museum's cantilevered design supported the site ecology by limiting the building footprint, allowing for over 24,000 ft^2 of plan area within a 11,347 ft^2 footprint.

By replacing the existing paved areas with plantings, the project reduced the site's rate and quantity of stormwater runoff by more than 20%. Currently, more than 60% of the site is planted or otherwise porous, allowing for 45% of all stormwater to percolate into the ground.

This photo shows the park's landscape as seen from inside the Center.

Photo: Polshek Partnership Architects

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Bioclimatic Design

The project team minimized the building footprint by cantilevering the museum, stacking office space in the archive wing, and embedding archive storage and support areas underground. As a result, more than 153,700 ft^2 of gross building area rests on a footprint of only 44,139 ft^2. In addition, the solar wall on the building's west elevation, a direct response to the summer climate in this region, reduces heat gain by 50%.

This photo shows the exterior view of the archive building.

Photo: Albert Vecerka

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Light & Air

The project design features extensive daylighting, and views to the exterior are provided from all museum and archive office spaces. Programmatic requirements for archival storage and support facilities prohibited daylighting in those areas. The same requirements prohibited operable windows for ventilation.

Carbon dioxide monitors integrated with the building-management system ensure that adequate ventilation is supplied. Desiccant dehumidifiers and humidifiers integrated with the building-management system and controlled with humidistats, thermostats, and fan coils ensure thermal comfort in all administrative, museum, and support spaces. Radiant-floor heating and cooling is used in the museum.

Recessed walk-off mats at every major building entrance reduce the amount of dirt and other pollutants tracked into the building. Deck-to-deck partitioning, dedicated exhaust, and appropriate plumbing are provided for all areas where chemical mixing was anticipated.

During construction, the project team protected ductwork and reduced contamination that could reduce indoor air quality once the building was occupied.

Percent of building area that is daylit: 37%

Percent of building that can be ventilated or cooled with operable windows: 100%

This photo shows the lobby's daylighting and view over the river.

Photo: Timothy Hursley

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Water Cycle

Thanks to low-flow fixtures, the project was projected to use 23% less potable water than a comparable, conventional project. This represents an annual savings of over 300,000 gallons of water.

The project's irrigation system, which covers 22 acres, is managed by a central control system that automatically programs run-times based on historical evapotranspiration rates for the Little Rock area and data obtained by a rain sensor. The design incorporates efficient sprinkler heads and nozzles. Based on a 30-year average of climate conditions in Little Rock, the system was anticipated to use 21.5 million gallons of water per year with an efficiency of 80%. This represents an annual savings of more than 7 million gallons, compared with a similar system operating at only 60% efficiency.

Precipitation managed on site: 45%

Total water used indoors: 1,044,450 gal/yr

Total water used outdoors: 21,538,242 gal/yr

Percent of total water from reclaimed sources:

Percent wastewater reused on-site: 0%

Calculated annual potable water use: 80.1 gal/sf/yr

This image shows an aerial view of the site plan and surrounding development.

Photo: Polshek Partnership Architects

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Energy Flows & Energy Future

The project was anticipated to use 25% less energy than a comparable building designed in minimal compliance with ASHRAE 90.1-1999.

A solar screen on the building's west elevation reduces solar heat gain by 50%. The research and archive wing uses perforated metal sunscreens to reduce heat gain and glare. Low-emissivity glass was used throughout the project. Air-handling equipment enclosed in unconditioned interstitial spaces underneath building provides insulation for the conditioned museum spaces. Much of the archive storage and support areas are embedded in the ground, providing additional insulation.

Displacement cooling in the museum space reduces the cooling load for that space by 40%, and radiant-floor heating and cooling reduces fan energy for the museum. Variable-frequency drives and pumps were used. Ventilation is supplied on demand, as determined by carbon dioxide monitoring.

A direct digital control (DDC) system controls the chiller, the boiler, and all water and air systems. All areas of the building are programmed for occupancy, including times of special events. Reporting to the DDC system is a fully integrated, computer-controlled lighting system for all public areas, also programmed for occupancy and special events. Archive areas are not automated due to the light sensitivity of some items. Occupancy sensors control lighting in restrooms and areas that receive infrequent use.

A 66,000 kWh photovoltaic array located on the archive roof provides 4% of the project's electricity needs, and the library has contracted for 100% green power for two years.

Energy security

Both the museum and the office areas have generous glazing to provide daylighting when available. In addition, battery-powered emergency lighting is supplied for all areas except archival storage, and an emergency generator would supply power to critical zones in the event of an outage.

ENERGY PERFORMANCE

Ratings

EPA:
HERS:
Percent total energy savings: 25

	Base Case	Design Case
Total energy (Btu/sf/yr)		77,667
Electricity (Btu/sf/yr)		
Natural gas (Btu/sf/yr)		
Other: (Btu/sf/yr)		

Heating (Btu/sf/yr)		30,077
Cooling (Btu/sf/yr)		27,803

Cooling capacity (sf/ton)		271.2
Lighting load connected (W/sf)		1.5
Lighting load after controls (W/sf)		1.2
Plug load (W/sf)		1.1

Peak electricity demand (W/sf)		

Percent on-site renewable energy:

Percent grid-supplied renewable energy:

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Materials & Construction

Materials were selected to protect indoor air quality and to minimize environmental impact. Adhesives, sealants, paints, and carpeting were selected for their low chemical emissions, and composite wood and agrifiber products were selected for their lack of added urea-formaldehyde.

In aggregate, 22% of the building materials, by cost, feature recycled content, as per LEED calculations. More than 40% of the materials manufactured for use on this project were manufactured within a 500-mile radius of the project. Of that amount, 67% (28% of the total building materials) are composed of raw resources that were mined, extracted, or harvested within a 500-mile radius of the project. The museum space features 25,500 ft^2 of bamboo flooring, a rapidly renewable material.

The project reused a significant amount of existing building stock. Choctaw Station, for example, was converted into the University of Arkansas School of Public Service—with telephone and data links to the archive building, library, and main campus in Fayetteville—and an abandoned railroad bridge was converted into a pedestrian bridge. The city also moved a couple of existing buildings to other locations.

The project includes on-site facilities for the collection and recycling of paper, plastic, glass, metals, and cardboard.

This photo shows the building's interior.

Photo: Timothy Hursley

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Long Life, Loose Fit

The project was designed in anticipation of a broad variety of uses and users. The library and archive building, Choctaw Station, and the 30-acre riverfront park were designed to attract local, national, and international visitors to do scholarly research, enjoy the interactive museum, take part in special events, and stroll along the reclaimed riverfront park. Additionally, the project was seen as a catalyst for generating economic, cultural, and social vitality to a formerly derelict part of the city.

Open research rooms and staff offices within the archive office building have controlled natural and electrical lighting, grids of telephone and data connection points, and flexible office landscape furnishings that would allow for future adjustment of these spaces with minimal disturbance, cost, and waste.

Built of steel, concrete, stone, glass, and metal, the buildings were designed to last at least 100 years; the mechanical equipment was designed to last at least 20 years. Program flexibility is provided throughout the museum building, in a 2,500 ft^2 gallery featuring changing exhibits, a 90-seat orientation theater equipped to host lectures, and a double-height 3,500 ft^2 multipurpose hall suitable for lectures, recitals, receptions, and symposia. All of these venues are wired for closed-circuit broadcast between each other and to network telecast trucks from the service parking area.

This photo shows the public terrace view through layers of tinted an transparent glass.

Photo: Albert Vecerka

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Collective Wisdom & Feedback Loops

The evolution of the project's design was a result of finding comprehensive solutions to programmatic and environmental realities. While President Clinton desired an open, inviting, and inspirational building, he also intended that it be an example of enlightened environmental policy.

As is often the case, reconciling the inherent conflicts in the complex building program led to the most innovative and interesting aspects of the design. The key challenge in this project was the cantilevered glass museum building. Its transparency and orientation posed the difficulty of overcoming the sun's heat on the building's west elevation and the greater thermal exposure of its underside. To respond to these conditions, a solar screen of transparent and tinted glass was incorporated, reducing solar heat gain by 50%.

This photo shows Choctaw Station.

Photo: Timothy Hursley

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Jury Comments

"We honored this project because of its catalyst role and because we want to recognizing buildings that have transformed a place. There's something about this project that represents a kernel of change."
– Anne Schopf, FAIA / Mahlum Architects / Seattle, WA

"This is about stewardship. One project starts the ball rolling. Several other projects—including the Heifer International project that is a winner this year—could not have been here without this one."
– David Brems, FAIA / Gillies Stransky Brems Smith / Salt Lake City, UT

"This honor points to the need to address how projects are reclaiming industrial sites in inventive ways, creating a whole new function for these sites. These are now destinations for locals and tourists. And then there is the fact that this is one of the most inventive, beautiful, groundbreaking presidential libraries we have in terms of architecture. It has a presence that the others lack. It addresses sustainability and serves as progenitor for this area. **– Susan Szenasy / Metropolis / New York, NY**

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The design team also included:

- Landscape architect
- Owner/developer
- Energy consultant
- Contractor
- Civil engineer
- Lighting designer