GREEN SYSTEMS

RAINWATER HARVESTING



Art museum boasts shades of green

BY RACHEL WENGER

rt museums are known for exhibits of all variety. Yet, this museum is the ideal venue for a "Shades of Green" exhibit. Not to display artwork with green as the themed color, but for the mechanical systems that helped the facility achieve LEED Gold recognition.

The ground breaking for a stateof-the-art art museum painted the news in Broward County, Fla., in May2012. Young at Art (YAA) museum, near Miami, was constructed to serve as a 55,000 square foot artistic outlet for the young and the young at heart.

Boasting the greenest of ultraefficient building systems and winning LEED Gold certification,

"We wanted to teach our visitors how to incorporate green living into their own lives and use the new building as a living laboratory for learning," Mindy Shrago said. the menagerie of colorful exhibits offer hands-on experiences and learning opportunities. YAA was built around a plan to make the facility a monument to fine arts, and energy efficiency and sustainability, as well.

The museum's compelling, asymmetrical design provides about 45,000 square feet of space. The space includes exhibition galleries, art studios, classrooms, program areas and 10,000 square feet dedicated to the county's library.

The founders of this non-profit organization are mother-daughter team. Esther (now retired) and Mindy Shrago, CEO of YAA. The two dreamt of this project for more than two decades. Their vision was to provide learning opportunities for all ages. Sustainability and being earth-friendly also took a prominent role in their planning.

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Everything serves a purpose at YAA. Native landscaping and recycled building materials prove that efficiency is always within reach. The building itself is carefully oriented on the 12 acre lot to reduce heat loads. Recycling and



Technicians routinely monitor water quality.

mechanical systems are exposed works of art so that visitors can watch and learn how everything works. With minimal ceilings, even the structure itself is open for examination.

"Young at Art uses every aspect of the building as a working example,"

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The water harvesting tank at Young at Art Museum.

said Erica Nelles, engineering architect at AECOM – co-design architect with Glavovic Studio. "There's no other building like it here in Broward County."

The facility's white reflective roof even serves more than one purpose: not only to deflect the Floridian sun, but also serve as a collection surface in conjunction with a BRAE rainwater harvesting system. About 18,000 square feet of the roof's surface is used to collect rain. Calculations attest that with roughly 60 inches of rain per year -540,000 gallons of rainwater will be available for use at YAA.

"The building has so much roof space. We figured, why not do something with it?" added Jeff Thompson, owners' rep and project manager of Broward County. "We get our fair share of rainfall each year. The rainwater cistern helps us to be as conscious of natural resources as we can be."

From the moment raindrops hit the roof of YAA, they make way through a debris screen on the way to the rainwater storage cistern.

Once larger debris, animals and insects are prevented from entering the cistern, the rainwater passes through a first-flush diverter – keeping the first flush of water from entering the tank. The first flush after a rain event inevitably contains a higher level of contaminants than later rainwater.

"The idea is to minimize the accumulation of organic material inside the rainwater storage tank, as this can compromise the quality of the collected rainwater," explained



A technician checks the "rainset" control station.

Eddie Van Giesen, public policy director at BRAE Rainwater Technologies.

Also important is that light not be permitted to shine in the tank, as this can stimulate growth of unwanted algae. Once passing through these pre-filtration devices, incoming water is introduced at the bottom of the cistern through a "calming inlet" to minimize turbulence.

"The goal is to improve water quality, reduce tank maintenance and to protect the pumps – all at once," explained Raj Hingoo, plumbing designer (then with) Hammond & Associates, a Broward County-based mechanical, electrical and plumbing (MEP) engineer firm.

After moving through the firstflush diverter, the water reaches the 5,600-gallon above-ground galvanized steel, flexible PVC-lined BRAE rainwater cistern – proving to be a real attention-getter at the museum.

Water is then pumped into a rainwater control station or Rainset, where additional filtration and treatment occurs. The pressurized rainwater leaves the Rainset and is piped to the toilets and urinals in the facility. In the event that there's not enough water in the tank, an automated municipal bypass function is built into the BRAE rainwater system.

The BRAE rainwater control system arrived preassembled on a factory-built skid. On-site technicians then placed the skid on a concrete pad behind the museum and made final electric and plumbing connections.

"Our company has worked with BRAE on previous projects, and we highly recommend them," claimed Freddy Lopez, assistant project manager at Pirtle Construction, the Broward County-based construction management company in charge of the YAA project. "BRAE was very helpful during the process, acting as a supplier and consultant at the same time."

"The installation was smooth sailing," explained Dave Pettit, project coordinator at BRAE Rainwater Harvesting. "Assembling BRAE tanks are like assembling puzzle pieces. Once the tank's shell is in place, we install pre-liner fabric that protects the PVC liner from touching the metal shell."

The galvanized steel tank is designed to reflect the Florida heat. The system uses the right amount

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of filtration to assure the appropriate water quality for the end use.

"We were very impressed by the technology in the BRAE system. After going through the string of filtration and treatment components, the water that Young at Art uses to flush their toilets and urinals is nearly drinking quality," Thompson said.

With a large section of the museum dedicated to nature-scapes and the use of sustainable products, the rainwater cistern is a focal point.

"The BRAE tank is typically the first thing visitors ask about when they enter the museum because it's visible from the highway, asking: 'What's that cool looking tank outside?'" Mindy Shrago said.

"For most of us, large rainwater harvesting systems are still unusual," Mindy Shrago. "But, hopefully, not for long. At YAA, the system is a working model of sustainability and recycling. It's not only cost- and energy-efficient for us, but it serves as an educational tool for visitors."

Also on site are two 10-by-4 foot solar thermal panels that heat domestic water in a 120-gallon storage tank.

Since the grand opening, YAA has received more than 100,000 guests. This September, the über-green museum/library hybrid was awarded the titles "Outstanding LEED-NC (New Construction) Public," as well as the "Outstanding LEED-NC Overall" from the USGBC.

"This important award for the design, energy efficiency and effectiveness of the new Young At Art Museum/Broward County Library facility also reflects our unique and creative partnership in programs and activities for the benefit of our youth," said Robert Cannon, director of Libraries Division of Broward County. "Working together in this building sets a new standard and provides the atmosphere where children can create, innovate and grow."

YAA is one of only three children's museums in the U.S., and the first and only museum in Florida (children's or otherwise) to obtain LEED Gold certification.

"Young at Art is so much more than we could have ever hoped for," Mindy Shrago said. "We're able to bring arts, learning and sustainability to the forefront all at once."

Rachel Wenger is an account manager and writer for Common Ground, a trade communications firm based in Manheim, Pa.



Technicians check operation of the "rainset" control station.



The facility.