



One with Nature

The center provides resources and outreach related to the sustainable management of large rivers.

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The [National Great Rivers Research and Education Center and Field Station](#) in Alton, Ill., is tracking for LEED Gold or Platinum certification with a two-phase construction process that will result in a 32,000-square-foot facility. The center sits on approximately eight acres leased from the Army Corps of Engineers will provide scientific resources and public outreach related to improving the sustainable management of large rivers.

The building is a symbol of innovation in design and construction of green technology and can be used to educate the public on the importance of environmentally friendly applications through construction. It is also a state-of-the-art research center that will provide a platform to educate future generations on sustainable management of the environment. The physical location of the building at the confluence of three major rivers adds to the educational aspect allowing for real-time experiments to collect data that can be used to effect government policies and standards.

The major challenge for the design team was taking innovative technologies and applying them to the building in a way that all worked congruently to achieve a highly functional structure. The project is located within a flood levee on federal property, which added difficulty to the permitting and construction process.

Construction Advances

The project, designed by AAIC, includes numerous technologies that are new to the construction industry. The architectural design of the façade was intended to mimic the Mississippi river bluffs of the area through the use of limestone and the unique installation process of “dry-stacking” and grouting from above and behind. The footprint of the structure itself was designed to flow with its surroundings and to provide the sense of a natural arrangement.

The living green roof and the outdoor rooftop classroom provide an energy-efficient structure with the capability of educating the public on green roof construction and the sustainability issues relevant to this geographical area. The water efficiency innovations minimize the use of domestic water on site

through an onsite wastewater treatment and reuse system and the reuse of rainwater captured onsite.

The project also contains a high percentage of recyclable materials including everything from recycled floor and wall tiles to the use of recycled paper for insulation. Located in the public areas of the building, a dashboard system quantifies all items inside the building and broadcasts that information to touch-screens aimed at educating the public on green technologies and environmental sustainability. Future plans for hydro-kinetic and wind turbine installations include turbines that will be directly tied into the building and will provide roughly half of the power for the building under full electrical load. They will also offer the ability for excess power created to be sold back to the grid supplier. These turbines will be used as educational tools to determine the best practices and applications for the numerous types of turbines available and for this geographical area.

Water and Wastewater Innovations

A key component in the design is the natural system to treat wastewater onsite that will also support water reuse and allow for water features to be incorporated into the new building. As well as qualifying for LEED points, the natural treatment system fit well given the unique ecosystem that is created by the confluence of the three rivers at the site and the organic building design.

The wastewater treatment and reuse system design is the outcome of a feasibility analysis completed by Jacques Whitford NAWA (JW NAWA), now Naturally Wallace Consulting (NWC). The wastewater treatment design is an engineered wetland treatment system, which includes 56 Infiltrator Quick4 Equalizer 36 Chambers installed in seven rows in the infiltration bed disposal system and enables the return of the treated wastewater into the soil. The reuse system design features a two-stage tertiary and secondary wetland treatment system with ultraviolet disinfection with the subsurface wetland cells incorporating native plants in the design. Infiltrator Quick4 Equalizer 24 Chambers are utilized at the influent (front) and effluent (back) ends of the engineered wetland system. The chambers are an ideal choice due to the sensitive ecosystem environment, and the fact that they are manufactured entirely from recycled materials. Ultraviolet treatment and Micron filter treatment are also incorporated, as well as a 5000-gallon greywater storage tank and system to feed toilets and urinals for flushing and to also facilitate external water recycling.

After the sewage is cleansed through the tertiary and secondary wetland systems the water is sent through the ultraviolet filter and stored in the 5,000-gallon storage tank. The storage tank is treated with an environmentally friendly chemical to keep the water fresh. That water is then pressurized and pumped into the building to flush all toilets and urinals.

The water feature will be filled with captured rainwater, greywater, river water, or domestic water. Additionally, 100 percent of the rooftop rainwater will be captured and stored in a 10,000-gallon storage tank. That water is pressurized and pumped to all hose bibs on site for the garage (truck/boat washing) and exterior bibs and a rooftop hose bib, both for landscape irrigation.

Once the second phase is complete, the project will be submitted under LEED version 2.2 in several categories.

National Great Rivers Research and Education Center

Owners/Operators: National Great Rivers Research and Education Center;
Lewis and Clark Community College; University of Illinois at Urbana
Champaign; Illinois Natural History Survey

Architects/Engineers: AAIC Inc.

Structural Engineer: EDM, Inc.

Civil Engineer: Sheppard, Morgan & Schwaab, Inc.

Landscape Architect: Terra Design Studios

General Contractor: River City Construction

Wastewater Treatment System Design: Jacques Whitford NAWA, now Naturally
Wallace Consulting; Infiltrator Systems Inc.

Major Manufacturers/Suppliers: Carlisle SynTec, green roof system; Ceres
Recycled Rubber, floor tile; Nucor, steel rebar; Arthur J. Lager Monument Co.,
stone veneer masonry; C&A Floor Coverings, carpet; Sandhill Industries, glass
wall tile; IceStone LLC, glass countertops; Applegate Insulation, insulation.

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Lossie E. Morris, AC, LEED AP, is an owner's representative at AAIC. Morris completed and received his LEEDAP certification through the USGBC in 2007. In 2010 he received a Level 1 Pervious Concrete Technician certification through NRMCA. Morris can be reached at emorris@aaicinc.com.