Virginia Tech Faculty and Students Partner with Prince William County to Transform Landfill into Eco-Park

The county is now seeking funding sources to make Virginia Tech’s Center for Design Research plan into a world-class model for education, recreation, and sustainable waste management.

Students and faculty from Virginia Tech’s School of Architecture + Design are working to transform a Northern Virginia landfill into an alternative resource that will benefit members of the community.

By 2020, the Prince William County Solid Waste Division intends to break ground on an innovative learning center at the county’s landfill site. The Center for Design Research is providing expertise and projecting a municipality into the future.
The creation of the eco-park is an initiative to expand waste management services into a larger community service through educational, social, and recreational opportunities. As a technology leader, the landfill supports the development and production of alternative energy and other innovative lifecycle issues of consumer products and related waste.

The “Eco-Park Learning Center” is a structure that will provide intensive “hands-on” learning opportunities to public schools, ranging from kindergarten to 12th grade. It will also serve as a gathering space where lectures, seminars and other community events can be held.

Tom Smith, the solid waste division chief of the Prince Williams County Solid Waste Division, approached Robert Dunay, director of the Center for Design Research and Robert Schubert, associate dean for research at Virginia Tech for assistance with the overall design.

“He was aware of some of our previous projects such as the LumenHAUS, a solar energy house that received considerable international recognition, Dunay said. “He knew about our interest in terms of engagement with projects outside the normal studio. There's also our ability to do something that benefits the larger community while fulfilling university responsibilities. One of the Center’s roles addresses the integration of research and teaching.”
Students in the School of Architecture + Design first began drawing up ideas and content for this project in the fall 2016 studio class directed by faculty members Nathan King, David Clark, and Dunay. Initially, students proposed individual schemes. Following a series of reviews by landfill workers and Prince William government officials, the schemes were narrowed down to three, named: Geode, Bridge and Ribbon. Each scheme comprised seven undergraduate and graduate team members.

Prince William officials chose the Geode scheme, which includes a green roof, cross laminated timber structures, components constructed from recycled materials and stabilazied earth blocks made from soil found on site. The following semester, a new set of students worked on the materials and dimensions, and a partner, George Mason University, joined the project as consultant for exhibits. Stroik Lighting Design in McClean, Virginia provided analysis and drawings for the lighting design. “We arrived at a design development scheme,” Dunay said. “We produced a number of documents for them — a set of design development drawings. The first document was ‘Waste Not. Generate,’ a summation of the three schemes.”

James Woods, a recent graduate of Virginia Tech’s undergraduate architecture program, has been involved with the project since last summer. “I had some friends working on (the project) as undergrads,” Woods said. “I was doing some work for another program that (Robert Dunay) is involved with. It came up that they needed someone with my skills and expertise.”
Following graduation, Wood stayed in Blacksburg to be involved in various community related efforts before this opportunity presented itself. As he joined at a more finalized stage of the project, he was in charge of visualization and refinement of the design development plans. “I was responsible for taking the cumulative efforts of everyone who had been involved and bringing it together as a unified vision, the parts had to become a whole,” Wood said. “Mostly, what I did was sort of bring the drawings up to snuff. I wasn’t making decisions at the zoomed-out level,” Woods said.

According to Wood, many of the artifacts for the project were a team effort. The model was partly constructed at Autodesk’s BUILD Space in Boston, and the 3D print lab in Cowgill Hall. The School of Visual Arts worked with the architecture team to create the animation for the video that walks viewers through the project.

Smith said the next step is raising the estimated $8-million in funds needed to build the facility. The year to break ground is fully dependent on funding. “We’d like to partner with some private businesses, the universities, as well as the county to come up with a program to fund the building,” Smith said.
As far as Virginia Tech's involvement, Smith believes that once the necessary funds are collected the university will stay on as advisors during the construction phase. As the project evolves, a new set of students will participate in the realization of the applied research components of the project, advancing the destination area, "Intelligent Infrastructure For Human Centered Communities." Continuing the trajectory of beyond boundaries the CDR is using the model of the Eco-Park Learning Center for a new project - a library for Mzuzu University in Malawi, Africa. (https://vtnews.vt.edu/articles/2018/02/univrel-mzuzulibrary.html) Fulfilling the goals of IIHCC, the Mzuni Library Project also resides in the destination area of Global Systems Science (GSS), linking faculty from six colleges across the university - CAUS, COE, CNRE, CALS, COS, and CLAHS.