

# Case Study



Completed in 2006 the Eco Restroom at the Bronx Zoo replaced a failing septic system, avoided an expensive connection to the overburdened combined sewer system, prevented pollution to the nearby Bronx River and saves over a million gallons of water each year.

## Bronx Zoo

*Bronx, NY*

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### *Background*

The Bronx Zoo has been educating and entertaining visitors since 1899. Owned and operated by the Wildlife Conservation Society, the Zoo has always had a strong focus on environmental conservation. Recently, however, the WCS has pushed to integrate conservation into the architecture of Zoo's facilities. In early 2004, this philosophy was put to the test when a restroom near one of the two major parking lots had to be replaced.

### *Planning*

The Bronx entrance receives more than half of the two million annual visitors to the Zoo. An old restroom building had been serving visitors through this entrance until it was shut down due to its failing septic system. Installation of a new septic system at the site was rejected due to concern over the pollution that such a system would cause in the nearby Bronx River. Creating a sewer connection at the site was a possibility, but would have required tunneling under the Bronx River Parkway at a huge cost. Moreover, the New York City DEP was not in favor of the sewer



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connection, since it would add to the combined sewer overflows for which the City is in violation of the federal Clean Water Act. The challenge for the design team was to create a modern, environmentally responsible restroom facility without the use of conventional flush toilets or conventional waste treatment technologies.

## Execution

In view of the site difficulties, composting toilets and a greywater irrigation system were a clear choice. Additionally, the sustainability of these technologies is consonant with the mission of the WCS.

Since the jurisdiction of New York City calls for sewer connections for all new construction, the systems for the new restroom required relaxation of the existing codes. The combined efforts of the WCS, designers Edelman Sultan Knox Wood, engineers P.A. Collins, and Clivus Multrum were crucial in educating local officials about the environmental benefits of the technologies and the soundness of the overall design. The result is an urban, non-sewered, high-use public restroom, which is educating a new generation about how to think about and manage human excreta.

Officially known as the Eco-Restroom, the new structure includes 10 large-size commercial composting units, housed in a full basement, that can accommodate more than 1/2 million visitors per year. Upstairs, the women's bathroom has 12 toilet fixtures, while the men's bathroom includes two toilet fixtures and four urinals. The Foam-flush toilet fixture was a natural choice for aesthetic reasons and as a way to conserve water. Because the foam-flush toilets use only 3oz. of water per flush, the Clivus systems are capable of saving over 1,000,000 gallons of water each year, as compared to conventional low-flow (1.6gpf) toilets. All wash water (both hand washing and janitorial water) is used in a greywater garden adjacent to the structure. This system, designed for 400 gallons per day, calls for an irrigation area of about 1000 sq. feet. Low-flow fixtures are used throughout. Maintenance of the systems is performed by Clivus Multrum.



Inside the Eco-Restroom educational signs explain the composting process and discuss water savings.



Composting equipment in the basement of the Eco-Restroom holds waste as it composts into stable fertilizer.

The Eco-Restroom, which opened late in 2006, has been a big hit with visitors and has been emphasized through WCS marketing activities. The Eco-Restroom was named New York Construction's 2007 Eco Project of the Year.