

WESTERN VIRGINIA REGIONAL JAIL
LEED® CERTIFICATION DESIGN PROCESS
AND PROJECT HISTORY

The Western Virginia Regional Jail is a state-of-the-art, 264,000 square-foot correctional facility which was constructed to relieve overcrowded conditions in the local jails of the four localities that make up the Western Virginia Regional Jail Authority—the counties of Franklin, Montgomery, and Roanoke and the city of Salem. The design firm for the project was AECOM; a global firm with offices in Roanoke, Virginia. The Regional Jail is the first correctional facility in Virginia to receive LEED certification and one of the first in the United States.

The Western Virginia Regional Jail Authority made the decision early in the design process to incorporate environmental or “green” features in the Regional Jail’s design. The members of the Authority felt that this was necessary in order to be good stewards of the environment as well as the public monies used on the project. Incorporating green features in the Regional Jail’s design would minimize the facility’s impact on its site which is adjacent to the Roanoke River in the Dixie Caverns area of Roanoke County. Green features would also generate savings on utilities which will generate ever-greater savings over the life of the building as utility costs continue to rise. The Regional Jail’s green features promote water conservation with the result that the building site now has less runoff than it did before it was developed. Many of these design features, in addition to promoting sustainability, also require less staff to monitor operations saving time and manpower costs.

In recognition of the Regional Jail’s environmentally-friendly design, the Authority made the decision to pursue LEED certification. The Authority’s representatives worked closely with AECOM to research which environmental features to include in the Jail’s design and consideration was given to green features that would pay for themselves within the first five years of the Jail’s operation. AECOM was able to incorporate the selected green features so that project costs were increased only 1.2 percent which is much lower than the industry standard of 5 percent for constructing a building to LEED standards. AECOM also ensured that there would be no delays in the project as a result of the added green features.

The Regional Jail’s innovative green design was awarded the 2009 Real Estate and Construction Review Northeast Green Building of America Award and a 2010 American Council of Engineering Companies Virginia Honor Award in the Building/Technology/Structural Systems category for its plumbing design.

Some of the specific green features included in the Regional Jail’s design are:

- ★ A siphonic roof drainage system which works in conjunction with the Jail’s water recycling program to remove rainfall quickly and efficiently for storage in the Jail’s rain water recovery system. This system provides superior performance and a greatly reduced initial cost when compared to a conventional equivalent.

- ★ A storm water recycling which stores 120,000 gallons of rainwater that is filtered and reused in the laundry operations. This system is expected to pay for itself in three years after which it will result in reduced annual operating costs.
- ★ Motion sensor operated faucets were used which are designed to save water in the administrative area. The payback for this equipment is expected in five years.
- ★ A vacuum assisted waste system which reduces water use by approximately one-third compared to a conventional gravity waste plumbing system. This system had an initial utility connection fee reduction, and it is estimated that the Jail will save up to \$350,000 a year in domestic water use.
- ★ An Energy Star roof membrane that reduces the heat load on the building and reduces air conditioning costs. The payback for the roof membrane is 15 years after which the annual operating costs are reduced.
- ★ Low-e glazing for windows in the administrative area which will reduce heat loss in winter and heat gain in summer. These windows have a payback of 10 years after which the annual operating costs are reduced.
- ★ Carbon dioxide sensors and controls in the administrative area to ensure a safe, clean environment for staff.
- ★ Motion detectors for administration lighting to turn off lights when not in use.
- ★ Commissioning of HVAC and plumbing equipment to fine tune the equipment for optimal operation.