

# Heritage Middle School



## Innovative Design

Size	149,925 square feet
Number of Students	950
Budget Projection	\$17,952,175
Final Cost	\$16,026,000
Year Completed	2004

Owner **Wake County Schools**



Since 1977, the solar and energy-efficiency features incorporated into our 4700 buildings (schools, homes and office buildings) have saved over 3.5 trillion Btu's (\$90 million). These savings have eliminated 700,000 tons of carbon dioxide (340,000 tons in schools) and, if converted to oil, reduced imports by the equivalent of 26.11 million gallons.

# Heritage Middle School

The U.S. Environmental Protection Agency has recognized the new Heritage Middle School as an SEDI building, "Designed to Earn the ENERGY STAR" rating. It has also been awarded the "School of Excellence" for 2004 by the State of North Carolina and named one of the top 25 Most Improved K-8 Schools. Heritage Middle School incorporates extensive sustainable design elements.

**Daylighting:** Natural light is the primary light source for all major educational spaces during two-thirds of the daylight hours. The daylighting strategy is based on south and north-facing roof monitors with fabric baffles that eliminate glare and distribute light evenly.

**Energy-Efficient Building Shell:** Window sizes and treatments vary with their orientation, location and function. Thermal break windows with low "E" glass were used in high-mass masonry cavity walls with foam insulation in the cavity and block cells to produce a superior insulated building envelope averaging an R-36. The roof has a minimum R-30 insulation with a radiant barrier that doubles as an air infiltration/exfiltration barrier that is consistently used throughout the building.

**Energy-efficient Electrical and Mechanical Systems:** The fluorescent lighting is dimmable and controlled by light and motion sensors that work in conjunction with the natural daylight. The HVAC system is a four-pipe boiler/chiller system with VAV units. The ductwork runs within conditioned or semi-conditioned spaces reducing losses.

**Domestic Solar Hot Water:** A 500 gallon solar thermal system preheats water for cafeteria use.

**Photovoltaic System:** A highly visible 2.5 kilowatt PV system, mounted on a covered walkway, provides power to the new building and serves as an educational tool.

**Rainwater Collection System:** Rainwater is collected from the roof into 5 underground cistern tanks totaling a storage capacity of 125,000 gallons. The water is used to flush toilets throughout the building and irrigate the football field by means of an automatic underground watering system.

**Constructed Wetland:** Combined with the rainwater collection system, the wetland reduces nitrogen discharge from the site by 85% below the amount discharged before construction. During construction, it served as the construction retention basin.

**Materials Recycling:** Recycled materials include carpet, metal roofing, VCT floor tile, play equipment and rock ground on site for the base of the parking areas. A mandatory waste management plan specified that construction debris would be recycled.

**Local Products:** Locally manufactured masonry products are the predominant structural and finish materials.



## Owner / Contact

Wake County Schools  
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## Design Team

Innovative Design	Architect
Barrett Kays	Landscape
Lysaght and Associates	Structural
Padia Consulting	PME
McIntyre and Associates	Civil

