RAINBOW ELEMENTARY SCHOOL
Coatesville Area School District

The new Rainbow Elementary School has achieved several exciting "firsts" for the Coatesville Area School District. For the first time in the Commonwealth of Pennsylvania, a school district is taking advantage of the Pennsylvania Department of Education (PDE) School Design Clearinghouse (SDC) program. By using a SDC design, Coatesville Area School District (CASD) was assured a design that meets cost efficiency and design standards established by PDE *and* CASD was able to realize a 10 percent increase in state construction reimbursement rate. The clearinghouse design for Rainbow was designed by Gilbert Architects for a school in Exeter Township. As the architect on the Rainbow project, Gilbert Architects was intimately familiar with the design which helped to minimize surprises or delays.

Plans were prepared for the new Rainbow Elementary School in 2007 with bids being received on April 1, 2008. The total estimated costs for construction of the new elementary school were $28,534,797. Bids came in at $24,869,224 and construction began shortly after that. Originally, the plan was for the School District to take occupancy over the 2009/2010 holiday break, but the construction schedule was shortened and students were able to start the 2009/2010 school year in their new building.

FAST FACTS:

Students from Kindergarten to 5th Grade - Total school capacity of 750 students
Two-story building with all common areas on the main, upper level - Building total is 113,695 square feet
Classrooms are arranged in "houses" by grade level, with a large, shared, open learning lab for each grade
Construction start date May 2008 - School occupied by CASD August 2009
First school in Pennsylvania to use School Design Clearinghouse Program
First school district in Chester County to register an elementary school for LEED for Schools Certification

Yet another important "first" for the new Rainbow Elementary School is pending Gold Leadership in Energy and Environmental Design (LEED) for Schools Certification. The new Rainbow Elementary School is the first public elementary school registered for LEED for Schools by a school district in Chester County and it will likely be the first to receive certification.

The Leadership in Energy and Environmental Design Green Building Rating System is a voluntary, consensus-based national standard for developing sustainable buildings. LEED was created by the U.S. Green Building Council to provide a framework for meeting sustainability goals and assessing energy performance. LEED recognizes achievements and promotes expertise in green building through project certification, professional accreditation, training and practical resources.

LEED measures green building performance in five catagories: Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, and Indoor Environmental Quality. In addition, points can be earned for Innovation & Design Process.

There are four levels of LEED certification, depending on the number of points achieved (Certified, Silver, Gold and Platinum). Rainbow Elementary School is attempting to achieve enough points to reach Gold certification. The following pages highlight some of the special features of Rainbow Elementary School that make this school more energy-efficient, less expensive to operate, AND a better educational experience for the students who learn here.

PROJECT TEAM:

Client: Coatesville Area School District
Architect: Gilbert Architects Inc.
MEP: Moore Engineering Company
Civil Engineer: CMX Engineering
Structural: Baker, Ingram & Associates
Acoustical: Acoustic Dimensions
LEED Consultant: 7Group

General Contractor: Lobar Inc.
Plumbing Contractor: Jay R. Reynolds Inc.
Mechanical Contractor: Frey Lutz
Electrical Contractor: Pagoda Electrical
Telecommunications Contractor: The Telephone Man

Special Features of Rainbow Elementary School

All classrooms and most occupied spaces have natural daylight and views to outside.

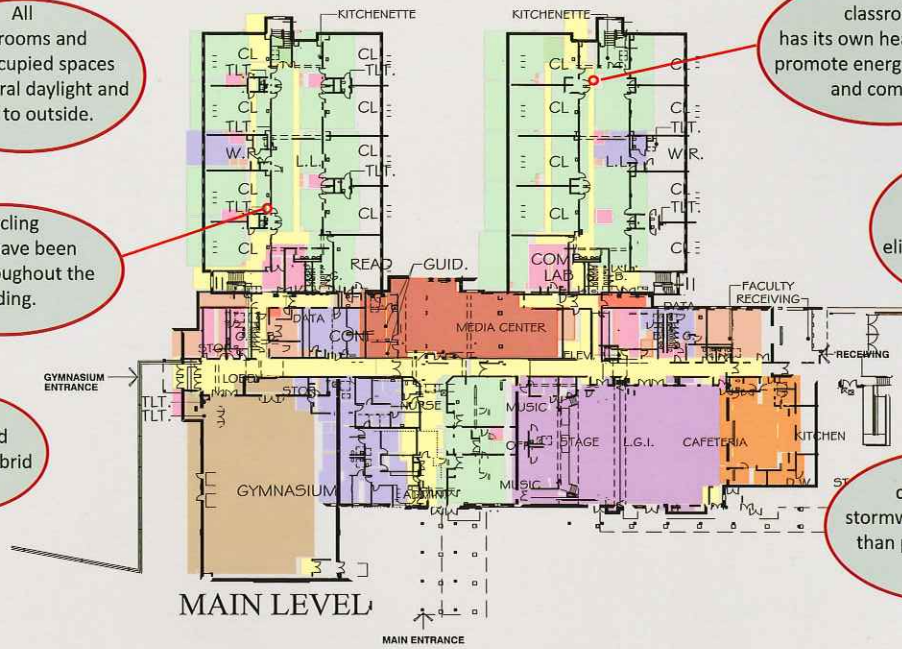
Every classroom has its own heat pump to promote energy efficiency and comfort.

Recycling centers have been placed throughout the building.

Regional plants are used on site to eliminate the need for irrigation.

There is dedicated parking for hybrid vehicles.

Post-construction stormwater runoff is less than pre-construction condition.



MAIN LEVEL

Many materials used throughout the building come from within 500 miles and have a high recycle content.

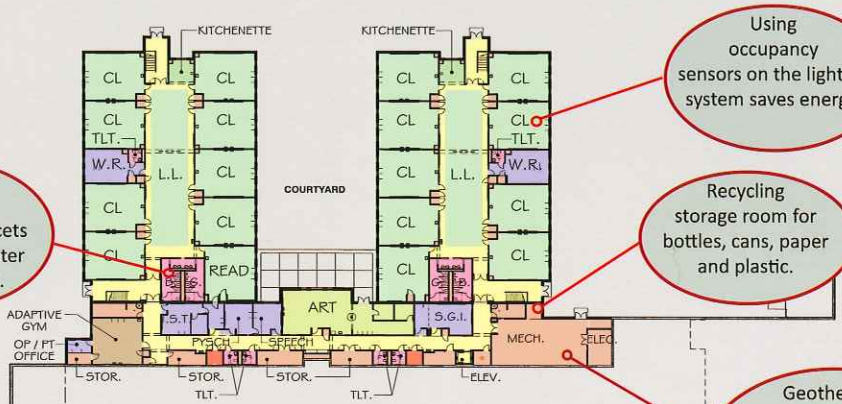
Eighty geothermal wells are located on the site northeast of the new school.

The roof system has a high reflectance rating to reduce heat gain.

Using occupancy sensors on the lighting system saves energy.

Low flow toilet, urinals and faucets help reduce water consumption.

Recycling storage room for bottles, cans, paper and plastic.



The old Rainbow Elementary School will be removed from the site after the new building is occupied.

Geothermal wells improve energy efficiency by using the constant temperature of the ground to assist in heating and cooling.

The school is being used as a teaching tool with its design construction methods and signage system.

LOWER LEVEL

COATESVILLE AREA SCHOOL DISTRICT - 1877 - FORWARD

gilbert

Sustainable Sites:

- The new Rainbow Elementary School is built on the same site as the old school. This location is close to multiple other community services and residential neighborhoods and re-using the site eliminates the need to develop precious farmland. The demolition of the old school helps to increase the open space on the site.
- Special care was taken throughout the construction process to minimize disturbance to the site and remediate any existing environmental concerns.
- Heat island effect for the building has been reduced through the use of a highly reflective roof selection. The material and color of the roof allow most of the sun's energy to be reflected rather than absorbed, thereby reducing cooling costs.
- Bicycle paths, storage, changing rooms, and showers are available for those who choose to bike to school. Preferred parking is designated for carpoolers and hybrid vehicles.

Water Efficiency:

- By using indigenous plants, the need for an irrigation system on the site has been eliminated.
- Low flow toilets, urinals and faucets have been installed throughout the building.
- Careful planning of the site allowed for an overall increase in pervious area. Using infiltration beds, swales and water quality structures improved the quality of the stormwater runoff.
- Commercial equipment used in the kitchen were selected in part for their water and energy efficiency.

Energy & Atmosphere:

- Rainbow Elementary School's geothermal ground source heat pump system makes use of the ground's constant temperature to assist in providing heating and cooling in the building. Ground source heat pumps reduce energy needs and have a life cycle more than double a traditional HVAC system.
- Occupancy sensors are used to control lighting in most spaces.
- Individual temperature control in each classroom helps to reduce unnecessary consumption and improve thermal comfort.
- During the integrated design process, building orientation, window selection, insulation and building materials are determined and have a significant impact on the building's energy efficiency.

Materials & Resources:

- Recycling containers for paper, plastic and cans are located in each of the classroom wings and other occupied spaces.
- During construction, any waste was segregated and, as much as possible, recycled. This resulted in 75% less debris going to landfills.
- Exterior and interior material selections considered the amount of pre- and post-consumer recycled content.
- Using regional materials helps to reduce transportation and the negative impact it has on the environment.

Indoor Environmental Quality:

- Every classroom has their own dedicated heat pump which allows each teacher to adjust to maximize thermal comfort. The heat pump closet is well insulated to minimze noise transmission into the classroom.
- Providing the school's occupants the ability to be connected to the outdoors through daylight and views has been shown to improve student performance and reduce absenteeism and illness. More than 90% of the core spaces have access to an outdoor view.
- Designing spaces, especially classrooms, for improved acoustical performance is good for students and teachers. Isolating and insulating mechanical equipment, as well as choosing sound-absorbing finish materials help classroom acoustics.
- Indoor air contaminants can be reduced by using low-emitting materials. Adhesives, sealants, paints, flooring, composite wood products and furnishings with low volatile organic compounds (VOCs) were used in this building.

Innovation & Design:

- Rainbow Elementary School has a series of sign posted around the building to help educate students and visitors about the building and its green, sustainable components.

Gilbert Architects Inc. 626 North Charlotte Street, Lancaster, PA 17603
717.291.1077 www.gilbertarchitects.com
gilbert