

L.R. Kimball designs highest-tech high school for Philadelphia Archdiocese

THE SITUATION

The Archdiocese of Philadelphia, the third-largest K-12 school system in Pennsylvania, planned to replace two existing facilities with a new high school. The new facility, Pope John Paul II High School, would be built on 93 acres in Upper Providence Township, Montgomery County.

The Archdiocese engaged L.R. Kimball to design the buildings and infrastructures for both new schools, each with an ultimate capacity of 1,600 students. As the initial phases of design began for Pope John Paul II High School, the L.R. Kimball team met regularly with a 25-person Building Committee comprised of professional and lay leaders and then with three subcommittees responsible for programming, design and construction. Working daily with these smaller, focused groups, along with an owner's representative and a construction manager, L.R. Kimball designed one of the most technologically advanced high schools in the nation, in terms of both communication and security.

THE CHALLENGE

The initial phase of Pope John Paul II High School, at 209,000 square feet and designed to accommodate 1,200 students, needed to include all core functions and specialized spaces to serve an ultimate student population of 1,600 students. The second phase will accommodate the additional 400 students within an anticipated 27,500-square-foot addition. The two-story school was nestled within a rolling landscape, with architectural massing that was responsive to the sun's motion, prevailing winds and natural vistas.

A key challenge was developing and adapting a prototype for the two distinctly different school sites, each comprising rolling terrain, wetlands and other environmentally sensitive areas, traffic and highway concerns. Furthermore, the designs would need to integrate the educational programs of three existing schools into the configuration of the new prototype building.

Project Overview

CLIENT:

Office of Catholic Education,
Archdiocese of Philadelphia

GOAL:

Provide an exciting and safe learning environment through the deployment of the most current technically advanced systems in the fields of education and security.

L.R. KIMBALL SERVICES:

- Architecture
- Structural, mechanical, electrical, and plumbing engineering
- Landscape architecture
- Construction administration
- Fast-track construction
- Communications network infrastructure assessment, design and implementation
- Security network infrastructure assessment, design and implementation
- Hard-wired and wireless data and multimedia system design

L.R. KimballSM
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ARCHITECTURE • ENGINEERING • COMMUNICATIONS TECHNOLOGY

AVIATION | CIVIL | CONSTRUCTION SERVICES | DATA SYSTEMS | ENVIRONMENTAL
FACILITIES ENGINEERING | GEOSPATIAL | NETWORKS | PUBLIC SAFETY | TRANSPORTATION

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While considering these architectural requirements, L.R. Kimball developed designs that would incorporate today's most current technologies and allow unprecedented communication and connectivity to classrooms, students, administrators and other schools within and beyond the Archdiocese system. By utilizing this same architectural topography to serve as the backbone for the electronic security protection at the facility, L.R. Kimball was able to afford an enhanced level of safety for students, staff and visitors while, at the same time, maximizing the economy of scale with regards to installation and cabling costs.

THE SOLUTION

In its architectural and engineering plans, L.R. Kimball employed a fast-track methodology for Pope John Paul II High School that saved months of construction time and costs. To advance the Archdiocese's mission of providing "an exciting and safe learning environment through the deployment of the most current technically advanced systems in the fields of education and security," L.R. Kimball developed a facility that now serves as a model for future technology-based strategies.

Communication Technology

Wiring the entire school with an IP-based TV broadcasting system enabled teachers and students to access cable TV, program media and a live video bulletin board from any building location. Every classroom was equipped with an LCD projector and interactive smart boards. Every student was provided with a wireless notebook computer that is Internet accessible from anywhere inside the school and up to 300 feet outside the building. Other sophisticated features implemented by L.R. Kimball included:

- Voice-over-IP, fully integrated with paging and intercom systems, and the ability to dial 911 directly from every classroom
- A theatrical-grade sound and media system in the Auditorium with two in-house mixing board and lighting control locations
- A sports-venue-grade sound system in the Competition Gym with program inputs, wireless microphones and adjacent parking and direct connectivity for a TV satellite truck



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- A TV Broadcasting Studio for student news programs, live video bulletin boards with both local and off site broadcasting through an IPTV media system.
- Elevating the smart classroom design concept by incorporating two active fixed-distance learning classrooms and pre-wiring all remaining classrooms for mobile distance learning via mobile-technology equipment carts.
- Independent data networks employing color coded cabling infrastructures to isolate educational and administration network traffic thus providing an additional level of network security.
- Communications Closets strategically located throughout the facility connected via multi-strand hybrid fiber optic cables, employing fault tolerant topography and protected by independent rack mounted UPS units.



Security Technology

Because L.R. Kimball led the design of the physical building, the team was able to integrate security elements into the architecture, landscaping, electrical systems and access to the facility. These measures began with ensuring open lines of sight around the building and the careful selection of landscape materials, illuminating the parking lot perimeter, pedestrian and vehicle approaches and contiguous space.

L.R. Kimball implemented technologies to protect people and property at the school. The systems included a fully integrated physical security information management platform with automated lockdown capabilities and partitioned security zones for restricted after-hours occupancy and elevated threat conditions. Entry to the school was regulated by proximity cards and more than 80 interior and 20 exterior TCP/IP-based day/night color video surveillance cameras were installed. The cameras offered built-in threat analytics and wireless downlink capabilities to first-responder units. All video surveillance cameras record footage around the clock with a storage capacity of more than 30 days for each camera.

Among the other security features integrated into the school are:

- School lockdown capability with a single button from administration offices, locking the perimeter and education wings of the building



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- A video intercom system at all entrance doors with remote access control and video recording to track visitors
- Personal photo ID badges and smart access control cards for students and staff
- Partition arming for the intrusion detection system to permit segregated arming at various levels. This approach provides the ability to permit public access, such as to the Gym and/or Auditorium, while restricting access to education wings during special events.
- From a cyber-security standpoint, separate dedicated local-area networks are provided for students, administration, points of sale, security and wireless access with a minimizing cross network breaches.



THE RESULTS

L.R. Kimball's design and technical engineering of the Pope John Paul II High School has produced a successful and significant example of contemporary school communications and security strategies. Opened for the 2010-2011 school year, the facility demonstrates the value of integrating electronic systems and design elements to achieve the Archdiocese's goal of providing an exciting and safe learning environment. L.R. Kimball anticipates that Pope John Paul II High School will serve as a daily success story that will be modeled by other school districts across the country.

L.R. Kimball - A CDI Company

Established in 1953, L.R. Kimball is among the nation's leading professional service companies offering its clients architectural and structural, mechanical and electrical design services, security systems designs, civil, environmental and transportation engineering expertise, communications technology solutions and consulting. With a focus on targeted results, expertly managed, L.R. Kimball is committed to offering its diverse public and private-sector clients a tailored approach designed to meet their needs and budget requirements. Headquartered in Ebensburg, Pa., the company employs more than 550 people at 10 locations in Pennsylvania, New Jersey, Texas, West Virginia, and Virginia.