

Several universities throughout the mid-Atlantic will soon be celebrating major new facilities for the performing and fine arts. Mueller's long-held expertise in providing mechanical and electrical engineering for these challenging buildings ensures that the systems will play a solid, but quiet, supporting role for years to come.

Towson University, located just north of Baltimore, Maryland, will soon celebrate the completion of its modernized and expanded Center for the Arts.



Engineering for Performance

Arts Centers on the Rise for Area Universities

One of the most important design aspects of the Center for the Arts at Towson University is being kept quiet—literally. Now undergoing a \$53-million modernization and expansion, the center will feature renovated performance and studio space and a new music recital hall, dance studios, and an art gallery. As mechanical/electrical engineer for the project, Mueller Associates was tasked with designing new systems throughout that would not interfere with the acoustics of the spaces.

Designing for Sound-Sensitive Spaces

“The relationship between mechanical systems and room-acoustics is critical,” says Jim Carroll, AIA, principal with Design Collective, Inc. The Baltimore-based architectural firm is working with Boston-based Wilson Butler Architects to design the

project. “A mechanically loud space would significantly detract from the performance,” says Carroll. “Sound mitigation is critical. There are 19 separate mechanical units in this building, most of which supply air to sound-sensitive spaces, such as performance areas and recording studios.”

The modernized facility will add 122,000 square feet to the existing

27-year-old, 165,000-square-foot facility. The work has been carefully phased to enable the university to continue to use the building, which houses programs within the College of Fine Arts and Communication, including Art, Dance, Electronic Media and Film, Music, Mass Communications, and Theatre Arts. Gilbane is serving as construction manager for the work, to be completed later this year.

According to Todd Garing, PE, project manager for Mueller Associates, the “large scale of the work, critical project phasing, and acoustical considerations were all primary challenges.” A number of the studio art classes, including ceramics, jewelry, and print making, also required industrial ventilation and custom engineering strategies to ensure safe use of the spaces. “The addition to the center wraps all the way around the existing building,” Garing notes. “That’s much more complex than simply adding a wing, in terms of renovating and extending the building systems. It also impacted many ventilation intake systems, which are now located on inside walls. Strategies to keep people comfortable and safe have been vital throughout the process.”

In addition to designing the mechanical systems, Mueller engineered the lighting, electrical, fire protection, and plumbing systems for the project. “This is a very large, complex project,” says Carroll. “Mueller has performed well across the board.”

Mueller is also teamed with Design Collective on Howard Community College’s new Visual and Performing Arts Instructional Building in Howard County,

Maryland. The 78,000-square-foot facility will house performing, visual, and media arts programs.

Intricate Details

A performing arts center under construction on another major campus has provided similar challenges for Mueller. The new, 92,000-square-foot Center for the Arts at the University of Delaware, designed by Baltimore-based Ayers Saint Gross Architects, will include a 450-seat proscenium theater, a 200-seat recital hall, and a 300-seat music rehearsal hall. The Whiting-Turner Contracting Company is serving as the construction manager for the project.

According to Michael Barber, AIA, project manager for Ayers Saint Gross, “Mueller does a good job of considering the work from the owner’s perspective in terms of budget, while also understanding the importance of the acoustical considerations. One of the typical approaches in a performance space is to line the ductwork with fiberglass to minimize sound from the HVAC system. But the owner wanted to limit the use of fiberglass and relied upon Mueller to create an alternative system. Mueller was very patient and offered good solutions and compromises.”

Todd Garing, as project manager for Mueller, noted that meeting the stringent acoustical requirements required “a lot of intricate details. The theater structure is actually isolated from the rest of the building,” he says. “There is no hard connection between the two structures, in order to isolate

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The new Center for the Arts at the University of Delaware had “aggressive” acoustical goals. Construction will be complete in mid-2006. ▶



vibration. This is challenging in terms of routing the ductwork, piping, and conduit between the two structures, while maintaining the isolation.”

“We also used an underfloor supply air plenum in the recital

hall,” says Garing. “There are small air diffusers under every seat. The acoustical goals were aggressive, and it required a lot of creativity.”

“Mueller really took a leadership role to be sure everything was

done right,” says Barber. “Their documentation was thorough, and they took extra steps to be sure everything was coordinated.”

Ayers Saint Gross and Mueller are also beginning design of another major project for the arts: the new Arts and Visual Technology Building at George Mason University in Fairfax, Virginia. The 75,000-square-foot building will include art galleries, studios, labs, classrooms, and offices.

Mueller has been involved with campus utility master planning and infrastructure design of several major medical and educational campuses throughout the region. Current and recent clients include:

- **Wake Forest University Baptist Medical Center; Winston-Salem, North Carolina**—*utilities master plan to support campus expansion*
- **National Institutes of Health; Bethesda, Maryland**—*utilities master plan update for 322-acre campus with 90 buildings*
- **Georgetown University; Washington, DC**—*feasibility study and design of central chiller plant expansion*
- **Coppin State University; Baltimore, Maryland**—*design of a satellite central utility plant and underground piping loop*
- **Loyola College; Baltimore, Maryland**—*utilities master plan for four campuses*
- **The University of Delaware**—*master utility plan for chilled water, steam and electrical systems*

Utility Upgrades Aid in Campus Expansions

Medical Centers, Universities Ensure That Infrastructure Meets Long-Term Demand

Envisioning the need to expand capacity and modernize patient care facilities, Wake Forest University Baptist Medical Center is continuing to rely on the expertise of Mueller Associates to plan for long-term infrastructure requirements. The center, located in Winston-Salem, North Carolina, has engaged Mueller to develop a master utility plan to support campus needs for the next 15 years.

The work involves an evaluation of the facility’s central heating, central chilled water, sanitary sewer, domestic water, electrical, and related systems. Overall loads on the central heating and cooling plant are anticipated to increase by 5,000 tons of cooling and 50,000 pounds per hour of high pressure steam over the next 15 years. “One of the unique aspects is the planned addition of a large 33-MW electrical boiler,” says Mueller Project Manager Steve Gillis. “This will provide substantial operating savings compared to conventional gas and oil-fired boilers. Duke Power is offering significant utility rate incentives to operate large components during off-peak hours.”

Mueller has worked with the Wake Forest University Baptist Medical Center continuously for the past 12 years. Completed work includes the floor-by-floor renovation of three buildings serving inpatient needs, and the design of the 200,000-square-foot J. Paul Sticht Center for the Aging.

Universities Prepare for Growth

Utility infrastructure upgrades are also underway for Coppin State University’s 38-acre campus in northwest Baltimore, Maryland, where a number of new buildings are planned. Mueller is assisting the university in adding new campus-wide fire alarm and security systems for the existing 11 campus buildings, an effort that will “establish the standards for the university’s ambitious master building plan growth,” says Gillis.

The existing central heating and cooling plant will be refurbished and expanded to serve four additional buildings. Mueller will also design the routing of new chilled water and heating water distribution piping throughout the

“The university has taken a major step forward towards building and revitalizing its facilities and infrastructure. The projects that Mueller is designing will improve operational efficiency and help us develop a state-of-the-art campus.”

—Maqbool Patel
Associate VP; Capital Planning,
Procurement and Contracts
Coppin State University

campus to accommodate the anticipated loads. New domestic water and sanitary sewer mains will replace the aging systems currently on campus.

Mueller has also been selected to develop a master utility plan for the University of Delaware. The university, which envisions continued growth in its physical plant, currently maintains nearly 450 buildings on three campuses in Newark, Lewes, and Wilmington.