MOMENTUM

WINTER 2026

ENGINEERING THE FUTURE OF INNOVATION

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ADVANCING RESEARCH, TECHNOLOGY, AND COLLABORATION ACROSS CAMPUSES

Across campuses, higher education institutions are reimagining how students learn, collaborate, and solve real-world challenges. From cutting-edge simulation labs and active-learning classrooms to AI-powered research environments and digital hubs, today's academic buildings must operate at the intersection of technology, wellness, and adaptability.

At Mueller Associates, we design systems that support these ambitious, thriving environments. Our engineers provide high-performance, sustainable solutions that promote discovery, creativity, and human connection. The following projects—from George Mason University's transformative Fuse at Mason Square and Life Sciences and Engineering Building to Towson University's new College of Health Professions and Bowie State University's Martin Luther King, Jr. Communication Arts and Humanities Building—show how engineering excellence continues to drive innovation and foster discovery for the next generation.

Fuse at Mason Square

Life Sciences and Engineering Building

Martin Luther King, Jr. Communication Arts and Humanities Building

College of Health Professions

From Bold Idea to Towering Reality

George Mason University's Fuse at Mason Square

A Catalyst for Innovation and Partnership

The new **Fuse at Mason Square** embodies George Mason University's vision for next-generation research and discovery, where academia and industry converge to shape the future of technology, learning, and collaboration.

Rising above downtown Arlington, Virginia, this 460,000-square-foot, 11-story digital innovation center is more than just an academic building; it is a public-private partnership between the university, the Commonwealth, and industry that supports Mason's Tech Talent Investment Program and advances the region's technology ecosystem.

Mueller Associates delivered electrical and plumbing engineering services for this flagship project, working closely with the P3 team, comprising **Edgemoor**, **Clark Construction**, and **Page (now Stantec)**, to develop

"Fuse represents the convergence of technology, academia, and community. Every system was engineered for adaptability and resilience, ready to meet evolving power, data, and sustainability goals, while maintaining seamless user experience."

Pathros Cardenas, PE
Chief Electrical Engineer, Mueller Associates

The Future Has Arrived at Mason Square

a resilient, high-performing infrastructure that supports advanced computing, artificial intelligence, cybersecurity, and digital research. The result is a building designed for adaptability, supporting connection among students, researchers, and corporate partners, while setting a new standard for energy efficiency and smart building integration.

A Platform for Discovery

Fuse is organized around “vertical neighborhoods,” corridors that link academic and corporate spaces throughout the building. These “Main Street” pathways are designed to spark spontaneous interactions, encourage cross-disciplinary exchanges, and advance partnerships beyond the campus. Inside these areas, Mueller’s systems sustain data-rich laboratories, immersive simulation setups, visualization studios, and adaptable classrooms.

Mueller’s electrical engineers designed a segregated power distribution strategy, using plug-in busways to cut feeder cross-sections by nearly 50% compared to conventional conduit systems. This approach maximizes electrical room capacity and future flexibility, while supporting Fuse’s demanding computing and visualization programs. Daylight-responsive lighting controls, occupancy sensors, and smart metering further boost energy efficiency and occupant comfort throughout the building.

A Living Laboratory for Sustainability

Fuse exemplifies advanced, sustainability-driven design, with goals of achieving LEED® Platinum and FitWel® 2-Star certifications. Located along the primary entry elevation, the building’s photovoltaic façade, developed through a close partnership between the architectural and engineering teams, combines aesthetic innovation with technical precision. The vertical array incorporates angled solar panels within the building’s curtainwall, generating renewable energy while allowing daylight and transparency for occupants.

Electrical wiring is discreetly routed through custom aluminum pathways concealed beneath the façade’s fins, reentering the building at each floor level, where integrated false panels conceal junctions and equipment. This approach preserves the system’s performance and visual integrity, while providing convenient access for future maintenance and upgrades.

The building’s plumbing design also reflects a deep commitment to sustainability and occupant well-being. Mueller’s team engineered distributed electric water heaters and low-flow fixtures, achieving a 40.8% reduction in LEED indoor water use. Additionally, a condensate harvesting system collects air-conditioning condensate from the DOAS air-handling unit and indoor VRF systems. The reclaimed

Sustainability in Design and Performance

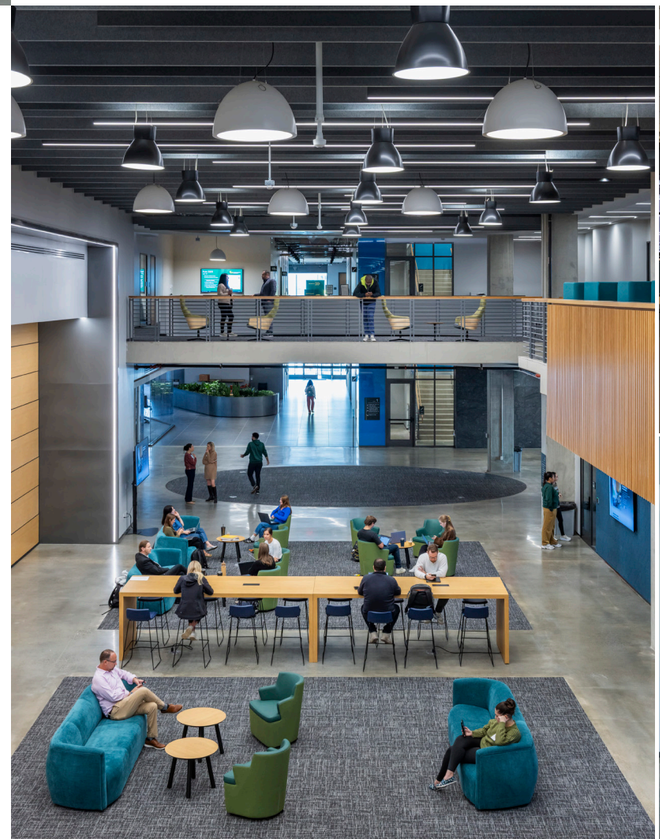
water is used to irrigate the building’s green roofs and landscaped areas, significantly reducing potable water demand.

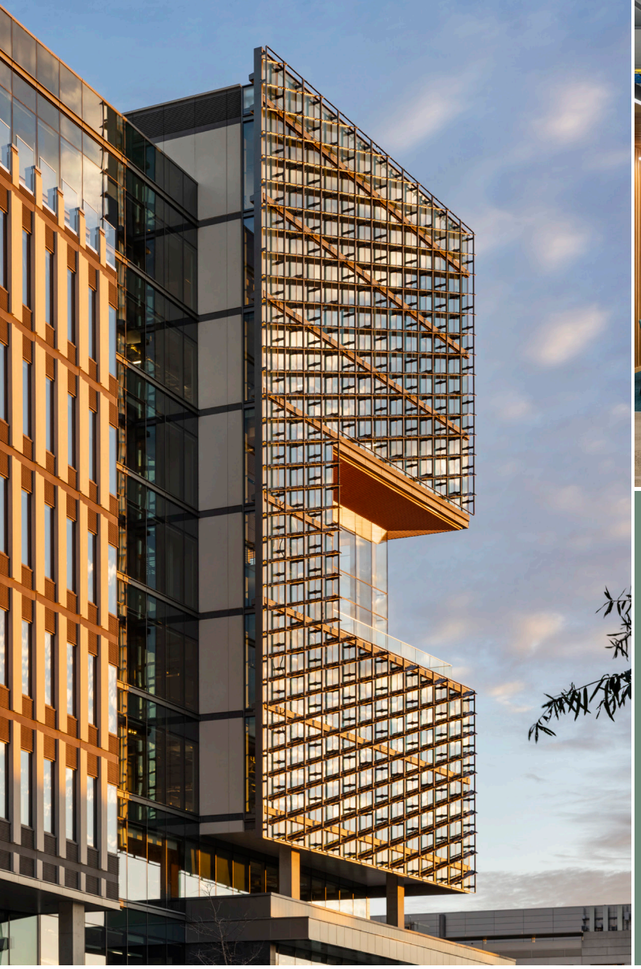
The stormwater system was designed for a rainfall rate of 4.4 inches per hour, exceeding the minimum rate specified in the Virginia Plumbing Code for the nearby Washington D.C. area by 37.5%. Designing the system above code minimum provides resilience against more frequent extreme weather events—further underscoring the design teams emphasis of durability and long term sustainability.

Together, these systems form a comprehensive sustainability framework that enables Mason’s facilities management team and Fuse’s researchers and tenants to monitor and influence the building’s environmental performance through real-time digital dashboards, transforming Fuse into a living laboratory for innovation and stewardship.

“From the earliest phases of design, Mueller’s goal was to ensure that the plumbing infrastructure could meet the building’s intensive demand profile and maintain sustainability performance. We implemented innovative water-use reduction strategies and designed them for long-term maintainability without compromising efficiency or the comfort of the building’s users.”

Karen Schulte, PE, CPD, LEED AP BD+C
Associate and Project Manager, Mueller Associates





SUSTAINABILITY BY THE NUMBERS

- 460,000 SF (11 stories)
- LEED Platinum and FitWel 2-Star certification
- Façade-integrated photovoltaic system
- High-performance building envelope
- Low-flow and condensate recovery plumbing systems
- Daylight-responsive controls and smart metering
- Occupancy-controlled receptacles and EV charging
- Real-time digital building performance dashboards

Supporting Research and Innovation

George Mason University's Life Sciences and Engineering Building

The Fuse at Mason Square integrates high-efficiency building systems and flexible infrastructure to support long-term sustainability within an urban academic environment.

A Catalyst for the Region

Positioned as the physical and programmatic anchor of Mason's Tech Talent Investment Program, Fuse reflects the university's long-term commitment to developing the next generation of engineers and computer scientists. According to Mason's President, Dr. Gregory Washington, "There's no better place for people to come, for students to come, for industry to come in order to tackle the problems of the future."

Fuse's flexible loft labs, maker spaces, and collaboration lounges further interdisciplinary research across AI, robotics, and cybersecurity, all fields critical to Virginia's economic competitiveness.

Engineering the Infrastructure of Innovation

Fuse at Mason Square exemplifies Mueller Associates' role in powering the infrastructure behind innovation.

Through a unified partnership with design and construction partners, Mueller's engineering solutions advance Mason's bold vision: creating a facility where sustainability, technology, and human ingenuity unite to define the next generation of digital discovery.

Advancing STEM-H Education

The new **Life Sciences and Engineering Building (LSEB)** at George Mason University's Prince William (SciTech) Campus is transforming the future of hands-on STEM-H education in Northern Virginia. This 133,000-square-foot, four-story facility supports advanced teaching and fabrication programs that bring together students and faculty from the College of Engineering and Computing, the College of Science, the College of Education and Human Development, and the College of Visual and Performing Arts.

Designed by **Page (now Stantec)** and engineered by Mueller Associates, the LSEB embodies design principles that prioritize flexibility, transparency, and occupant well-being. Its open, light-filled interiors encourage cross-disciplinary interaction—students in biomechanics or bioengineering may share lab space and ideas with peers in computer science, virtual reality, or human performance studies. This integrated environment cultivates a dynamic learning culture rooted in discovery, collaboration, and hands-on experience.

"This building shows how flexible, innovative engineering can adapt to changing academic needs and provide long-term reliability. Our systems were designed to anticipate the next generation of instructional demands, not just support the current one."

Daniel Carmine, PE, LEED AP
Associate and Senior Project Manager, Mueller Associates

Interdisciplinary Learning in Action

Mueller designed mechanical, electrical, plumbing, and fire protection engineering solutions tailored to support an exceptionally diverse range of teaching laboratories and instructional environments. The building includes wet and dry labs; anatomy, cadaver, and tissue-engineering suites; motion-capture studios; fabrication and prototyping labs; advanced manufacturing spaces; and virtual-reality learning environments—each with specialized ventilation, temperature, humidity, power, and equipment requirements.

The LSEB is also distinguished by its biophilic design and wellness principles, featuring solar-shaded façades, generous daylight, and clear sightlines across teaching and lab spaces. These features support its goal of achieving LEED Silver certification and enhance both environmental performance and occupant health. Throughout the building, Mueller's engineering systems contribute to sustainable, reliable, and resilient building performance while maintaining comfort and safety across lab-intensive teaching functions.

Science, Engineering, Human Performance

George Mason University's Life Sciences and Engineering Building integrates specialized laboratory environments and advanced building systems to support hands-on learning, research, and human performance studies.

George Mason University's Life Sciences and Engineering Building integrates specialized laboratory environments with Mueller's high-performance mechanical and electrical systems to support rigorous research, instruction, and testing.

Since opening in January 2025, the LSEB has become a lively center for experiential learning. Mechanical engineering students prototype autonomous vehicles, bioengineering students explore tissue and fluid dynamics, and education students engage in applied human-movement studies—all in instructional spaces that blur the boundaries between the classroom and the lab.

Students in the Patriot Motorsports club are constructing a Formula SAE race car, while others test drones and autonomous vehicles in the building's two-story high-bay lab. The first-floor advanced manufacturing and wind-tunnel labs serve as hybrid instructional spaces, combining seminars with hands-on experimentation.

By bringing these programs together under one roof, the LSEB promotes a learning community defined by connection, curiosity, and shared resources. The building strengthens Mason's broader mission to support regional innovation, advancing Northern Virginia's emerging biotechnology and life sciences ecosystem, and preparing the next generation of engineers, scientists, educators, and technologists to thrive in a rapidly evolving world.

Underpinning this collaborative environment is a robust engineering infrastructure designed to support flexibility, safety, and future growth. High-performance mechanical and electrical systems accommodate a wide range of teaching, research, and testing activities, while allowing spaces to adapt as programs evolve. This systems-driven approach ensures the LSEB can continue to support hands-on learning, interdisciplinary research, and innovation well beyond its opening year.

Supporting Modern Learning and Expression

Bowie State University's MLK Communication Arts and Humanities Building

Mueller's integrated building systems support Bowie State University's Martin Luther King Jr. Performing Arts Center as a flexible, acoustically refined venue for performance, learning, and community engagement.

Empowering Voices Through Design

The new **Martin Luther King, Jr. Communication Arts and Humanities Building** at Bowie State University (BSU) marks a milestone in the future of communication, culture, and technology. As the university's most utilized academic facility, this 192,000-square-foot interdisciplinary hub unites programs in media, performing arts, and the humanities, advancing BSU's mission to empower voices of change and celebrate its legacy as Maryland's oldest HBCU.

Mueller Associates provided mechanical and electrical engineering services as part of a design-build partnership with the **Whiting-Turner Contracting Company** and **Perkins&Will**, delivering specialized systems tailored to the various technical needs of media production, broadcasting, and performance.

"This project demonstrates how thoughtful engineering supports Bowie State's creative and academic mission. By integrating quiet, adaptable systems into such a technically demanding environment, we helped create spaces where communication and learning flourish in harmony."

Rebecca Fischer, PE, LEED AP BD+C
Associate and Project Manager, Mueller Associates

Performance, Purpose, Community

Sophisticated Spaces for Art and Learning

The MLK Building includes dual TV studios, radio stations, and DIY recording labs, each needing precise environmental control and acoustic isolation. Mueller's engineers designed sophisticated HVAC systems with dedicated zoning to maintain optimal sound quality and air balance while minimizing background noise.

It also includes a 1,500-seat auditorium, two 150-seat tiered classrooms, and 18 flexible active-learning spaces, each outfitted with smart lighting, audiovisual, and electrical systems. Specialized ventilation techniques and low-velocity air distribution enhance comfort and acoustical clarity, while energy-efficient systems align with BSU's dedication to sustainability and operational resilience.

Sophisticated Spaces for Art and Learning

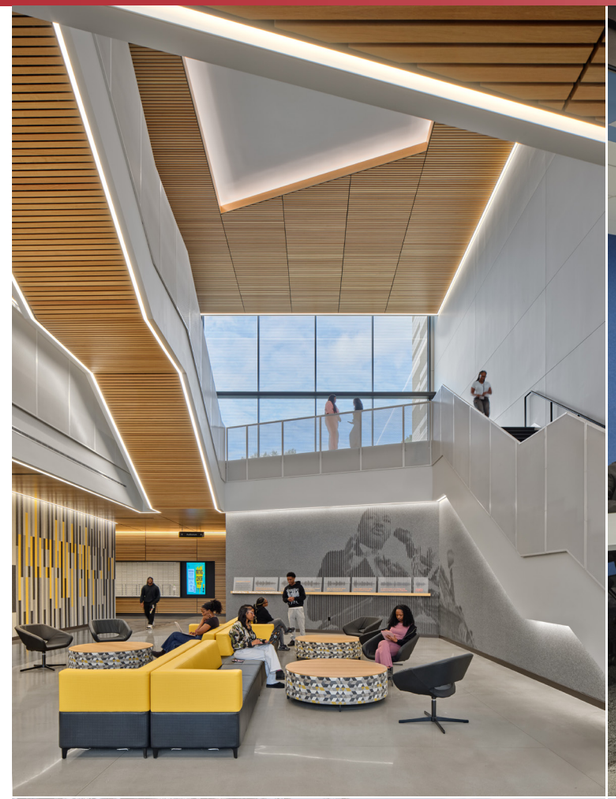
One of the project's main challenges was developing sustainable systems that could be fully integrated within the building envelope. Efficient air-cooled chillers deliver chilled water, and high-efficiency condensing boilers produce hot water for the building's dedicated outside air-handling units. A separate high-temperature chilled-water loop supplies the fan-powered terminal units serving each learning space, enhancing system efficiency and control.

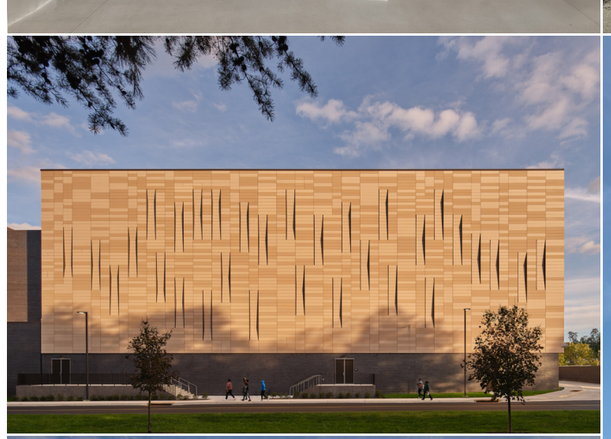
In the building's sound-critical environments—including the auditorium, TV studios, and recording spaces—multi-zone, variable air volume (VAV) air-handling units deliver conditioned air at low velocities to minimize background noise and maintain pristine acoustics. Together, these strategies are expected to achieve 18% energy savings compared to the applicable ASHRAE 90.1 baseline.

The entire building also features an adiabatic humidification system that keeps indoor relative humidity at 40% during winter months, improving occupant comfort and maintaining stable environmental conditions for the performance and broadcast areas.

Beyond its technical sophistication, the MLK building's design exhibits transparency and connection, linking interior learning spaces with exterior plazas and gathering areas that reflect BSU's vibrant community spirit. Mueller's integrated engineering solutions enable that vision, supporting a facility that stands as both a beacon of academic excellence and a platform for the next generation of storytellers, journalists, and creators.

A Cultural Campus Anchor





Inspiring Healthcare Excellence

Towson University's College of Health Professions

Designed to support clinical education, the building's systems ensure comfort, safety, and environmental control across teaching and simulation spaces.

Integrating Technology, Comfort, and Collaboration in the Health Sciences

The new **College of Health Professions (CHP)** at Towson University represents a significant advancement in healthcare education in Maryland. After decades housed in a 1960s-era building, the 240,000-square-foot facility combines multiple programs under one roof, creating a modern environment that reflects current clinical settings.

Designed by **Perkins&Will** in partnership with **JMT Architecture**, the center incorporates simulation-based learning, hands-on patient care, and collaborative research to train the next generation of clinicians, therapists, and healthcare professionals.

"The CHP demonstrates how integrated engineering can advance the mission of healthcare education. Every system was designed with flexibility in mind, capable of adapting as instructional methods and technologies evolve."

Clark Davenport, PE
Associate and Senior Project Manager, Mueller Associates

Advanced HVAC and electrical systems provide the precise environmental control, reliability, and flexibility required for clinical teaching and simulation.

Integrating Technology, Comfort, and Collaboration in the Health Sciences

Each CHP space requires precise control of temperature, humidity, and air quality. Advanced HVAC systems ensure occupant comfort and safety while preventing cross-contamination among specialized environments. The building is ventilated and conditioned using a hybrid HVAC system designed for both energy efficiency and future flexibility.

Dedicated outside air systems (DOAS) coupled with fan-powered terminal units with sensible cooling coils serve the densely occupied classrooms, laboratories, and public areas, while energy-efficient VAV systems condition the administrative zones. A dedicated heat-recovery chiller supports critical environmental loads and delivers substantial savings for both heating and cooling during regular operation.

The electrical infrastructure was engineered to support the building's extensive medical and simulation equipment, ensuring reliability and resilience for critical operations. A robust emergency power distribution system was also provided to maintain continuity of essential functions. This system powers HVAC equipment to preserve critical environmental conditions during a loss of normal power, a necessary safeguard for Towson's simulation-based learning environments.

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YEARS

Mueller Associates, Inc.
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ENGINEERING GREAT EXPERIENCES

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