

bkm



Summary of Qualifications

K-12 Market Sector

we are engineers who listen

K12 Experience

- Anne Arundal County Public Schools
- Baltimore City Public School Systems
- Baltimore County Public Schools
- Calvert County Public Schools
- Carroll County Public Schools
- Cecil County Public Schools
- Charles County Public Schools
- Harford County Public Schools
- Howard County Public School System
- Loyola Blakefield
- Montgomery County Public Schools
- Mount de Sales Academy
- Prince George's County Public Schools
- The Maryland School for the Blind
- Prince William County Schools
- Queen Annes County Public Schools
- Wicomico County Public Schools

About BKM

BKM is an engineering firm that listens. Backed by 58 years of responsive client experience and a shared commitment to collaboration, we design holistic MEP solutions that allow our clients to do their best work.

Based in Baltimore, Maryland, our team of 106 professional and technical staff includes 43 registered engineers, 20 EITs, and 22 LEED/WELL/Green Globes Accredited Professionals. Our engineers have extensive experience across education, mission critical, government, healthcare, science & technology, and commercial sectors, and are deeply knowledgeable of the codes and regulations our work must satisfy.

BKM was founded in 1968 with core values of transparency, responsiveness, extreme diligence, and the celebration of great ideas. Today, James L. Barrett, Jr., Mark A. Flickinger, and Anthony R. Page lead the firm with these values instilled in everything we do. From the management-level professionals actively involved in every project to the innovative solutions we develop for our clients, exceeding expectations is always our goal.

Throughout the mid-Atlantic region—and nationwide—BKM's work at schools, data centers, public safety buildings, laboratories, medical centers, even Camden Yards is well established.

>50%

MEP Prime Work
Allocation

<1%

MEP Prime Change
Orders

58

Years Providing K12
Engineering Services

58

Years of Service
Excellence

43

Professional
Engineers

81%

Work from Repeat
Clients

Core Capabilities

Mechanical Design



We tailor our mechanical designs to meet the requirements of every project with a focus on indoor environmental quality, efficiency, maintainability, and flexibility. Our engineers recommend systems that will best serve the function of the space and provide the best possible environment for its occupants.

Electrical Design



At BKM, we understand the complexity of power systems and the responsibility owners face to provide service to a large number of users. Maintainability and energy efficiency are key aspects to our electrical system designs. Our engineers design safe, reliable, and efficient power distribution systems.

Plumbing Design



Our engineers are well versed in plumbing and piping design allowing clients to rest easy in knowing we are looking out for their best interests. As with all other systems, plumbing must suit the client's objectives for sustainability, user convenience, cost constraints, and space limitations.

Lighting Design



Proper lighting design strikes a careful balance between the artistic vision of a space and the comfort, safety, and aspirations of its occupants. BKM is dedicated to providing an attractive and streamlined lighting design that is fully coordinated, sustainable, and economically attainable for our clients.

Commissioning



BKM's commissioning process ensures the owner receives the full benefit of their building systems, which include inter-related automation systems to maximize energy efficiency and occupant comfort. Our goal is to provide the building manager with the training and experience to monitor the facility and be comfortable to modifying components to align with the changing needs throughout the building's life-cycle.

Building Assessments



Because of our thorough understanding of how the MEP systems are interrelated and how they affect decisions in other disciplines, our approach is inherently holistic. We can quickly recognize the positive and negative impacts of various decisions, helping our clients to work through the possibilities, clarify their vision, and then make it a reality.

Power Systems Studies



BKM understands the importance of electrical safety, maintenance, reliability, and asset protection within your facility. Our Power System Engineers specialize in load flow, fault current, coordination, protection, and arc flash studies. Our goal is to minimize your down time while maximizing protection of your assets and personnel.

Energy Modeling



BKM offers whole building energy analysis to satisfy the growing needs of building owners in an increasingly energy cost-conscious market. Building energy analysis plays a crucial role in the earliest stages of design, informing the building owner and design team of the true impact and value gained by various siting, envelope, and MEP systems design strategies. Services can be provided to address LEED/Green Globes requirements, building life cycle cost analysis, building energy code compliance, and utility incentives and rebates.

CFD Modeling



CFD is an essential part of the design process for critical spaces. CFD allows us to optimize the design of a space by evaluating space configuration, airflow distribution, operating conditions, and energy consumption. We work with our clients to produce a design that is energy and cost effective while ensuring that the design can maintain the desired space setpoints.

K-12 Leadership & Team



Colgate Elementary School Replacement,
Baltimore County Public Schools, Baltimore, MD



Matthew D. Sol, PE, LEED AP BD+C

As the K-12 Market Sector Leader, Matt's primary responsibilities include the design, layout, and sizing of heating, ventilation, and air conditioning systems. He works collaboratively with the owner and design team to understand project goals and coordinate the design across all disciplines.



Andrew C. Endres, Jr., PE, LEED AP BD+C

Andy possesses extensive experience in engineering, all of which has been with BKM. He is responsible for directing the design team, maintaining coordination, and establishing the standard of quality for the project. Andy specializes in the design of K12 schools.

K-12 Leadership & Team



Luke D. Puller, PE, GGP

Luke is a registered professional engineer who designs mechanical systems and coordinates with the project team to ensure successful delivery. He's passionate about achieving outcomes that surpass expectations and staying current with the latest industry trends and technologies.



Michael J. Gillum, Jr., PE, GGP

Mike has spent his entire career at BKM. He specializes in K12 education projects. Mike is responsible for mechanical systems design in addition to managing coordination with the project team. He strives to deliver projects that will exceed expectations and will have an impact on the building occupants.



Steven J. Glock

With over forty years of electrical consulting experience, Steve serves as the primary Electrical Project Manager, leading and coordinating with project architects to ensure quality and efficiency. He specializes in K-12 facilities, bringing deep expertise in creating functional, budget-conscious designs.



Hugo E. Diaz, PE, LEED AP BD+C, SEA

As Director of Sustainability, Hugo drives our leadership in sustainability trends, including technology, green building, and energy codes. With over a decade of experience in energy modeling, consulting, and code compliance, he helps clients achieve high-performance, cost-effective, sustainable designs.

K-12 Portfolio



Harford Academy | Bel Air, MD

The new Combination Harford Academy and Elementary School includes a Public Day School for students with intensive special needs and a conventional elementary school.

The building uses a four-pipe heating and cooling system with high-efficiency chillers, N+1 condensing boilers, central VAV air handling units, and dedicated systems for large-volume spaces. The design includes HVAC redundancy and places all routinely serviced equipment in mechanical rooms and penthouses. The project is targeting LEED Silver certification. **Design: 2026, Construction: 2028, Cost: \$125M**



Hillsmere ES | Annapolis, MD

BKM served as the MEP consultant for the 68,000 SF replacement Hillsmere Elementary School, designed for 509 students and featuring comprehensive learning, arts, and support spaces with a LEED Silver target.

The project includes a chiller/boiler system with FCUs, DOAS ventilation, supplemental DX cooling, LED lighting, a 200 kW generator, and provisions for future solar PV. **Design: 2022, Construction: 2024, Cost: \$27M**

Northern Middle School Replacement | Owings, MD

BKM served as the MEP consultant for the new 110,000 SF, three-story Northern Middle School in Owings, MD, part of the Calvert County Public School system. The school is being constructed on the same site as the existing middle school and Northern High School. Close coordination was required to phase the well and septic system change over.

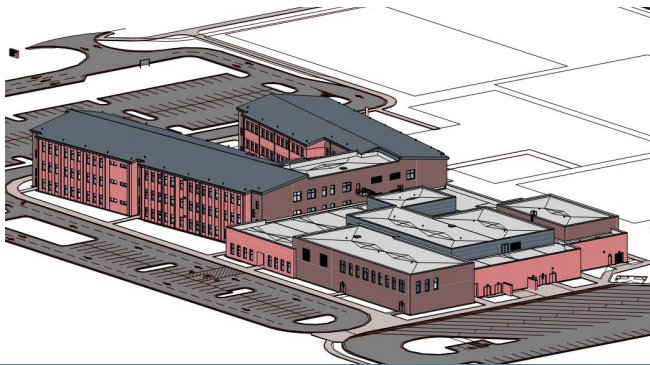
Designed as an all-electric facility for 775 students, the school features classrooms, arts spaces, a media center, cafeteria, and gymnasium. The HVAC system uses a heat recovery VRF system with heat pump DOAS units for ventilation and energy efficiency, supported by a 4,000-amp electrical service with provisions for future solar PV. A heat pump domestic water heater was provided for higher efficiency, all electric waater heating. All lighting is LED with low-voltage controls, and the project is pursuing Two Globes certification under the Green Globes rating system. **Design: 2024, Construction: 2026, Cost: \$57M**





Dulaney High School | Timonium, MD

BKM is serving as the MEP consultant for the replacement Dulaney High School project. This project consists of a multi-story approximately 345,000 SF new high school located on the same site as the existing high school. The primary HVAC system is a four-pipe chilled and heating water system served by air-cooled chillers and gas-fired condensing boilers. Classrooms and administrative areas use vertical fan coil units with ventilation from rooftop DOAS units, while larger spaces like the gym and auditorium are served by DX rooftop units with hot water heat. The building includes two 4,000-amp electrical services, a permanent generator, and LED lighting with energy code-compliant controls. Additional detached facilities include a maintenance building, greenhouse, concessions building, and stadium press box, with phased construction over four years to minimize disruption. This process is pursuing Two Globes under the Green Globes certification process. To help achieve this photovoltaic systems will be installed on the majority of the roof. **Design: 2025, Construction: 2028, Cost: \$200M**



Middletown ES/MS Replacement | Middletown, MD

BKM served as the MEP consultant for the new three-story, co-located Middletown Elementary and Middle School in Frederick County, MD.

The design features a VRF/DOAS HVAC system with energy recovery, dedicated DX units, LED lighting with relay-based controls, a permanent generator for life safety and shelter needs, and full electrical coordination with Potomac Edison. This project is pursuing LEED Silver certification. **Design: 2025, Construction: 2027, Cost: \$100M**



Nottingham MS | Rosedale, MD

BKM served as the MEP design consultant for the 205,000 SF Nottingham Middle School in Baltimore County, a multi-story facility for 1,500 students with classrooms, labs, arts, athletic, and Parks and Recreation spaces.

A geothermal heat pump system with over 200 wells was selected as the most cost-effective HVAC solution, complemented by rooftop DOAS units, LED lighting, an emergency generator, and a solar PV array, earning the project LEED Silver certification. **Design: 2022, Construction: 2024, Cost: \$90M**

K-12 Portfolio



Montgomery County Public Schools engaged BKM to design the partial HVAC replacement at Matsunaga Elementary School, including new water-source heat pumps for classrooms and student spaces, as well as seven replacement air handling units of various types.

The project also includes new branch piping, exhaust fan and heater replacements, and the necessary architectural, structural, and electrical modifications to support the mechanical upgrades.



BKM served as the prime consultant on this HVAC Systemic / Plumbing Renovation project encompassing 78,000-square-foot facility.

This project included the demolition of all the existing mechanical equipment (i.e. chiller, boilers, air handling units, pumps, unit ventilators, exhaust fans, heaters, etc.) and the associated piping and ductwork. A variable refrigerant flow (VRF) / dedicated outside air (DOAS) system was selected due to phasing and energy efficiency advantages.



BKM provided MEP design services for the open space enclosure and systemic renovation at Oliver Beach Elementary School.

This project encompassed a full HVAC system replacement. The new system included a chilled water VAV system with VAV terminals that include hot water heating coils. Several open space classrooms were also enclosed as part of this project.



BKM served as the prime consultant for this Rooftop Unit Replacement project.

This project included replacement of over 20 rooftop units serving classroom, office and library spaces. The project also included replacement of the heating water plant consisting of two condensing boilers and associated heating water pumps. A phased occupied construction is anticipated and the final schedule will be coordinated with the school to limit disruption to the learning environment.

McDonough High School HVAC System Renovation Charles County Public Schools | Pomfret, MD



Size

175,000 SF

Cost

\$11,900,000

Completion Date

2026

Capabilities

Mechanical
Design,
Electrical
Design,
Plumbing
Design

BKM served as the prime consultant on the McDonough High School HVAC System Renovation project. This school is a 175,000 SF, three story building that was built in 1977. The existing HVAC system consisted of a four-pipe chilled/heating water system serving air handling units throughout the building. Sixteen (16) air handling units that were original to the building were replaced. The majority of the units were located in the mechanical penthouses while a few were relocated to the roof to allow for adequate clearances. Calculations were performed to ensure code compliant outdoor air flow rates were being met. In addition, all existing VAV terminals were replaced and new heating water piping was extended to each VAV terminal since the existing units did not include reheat coils. The existing VAV zones were evaluated and modified to ensure each classroom had individual room control. Additionally heating water pumps, chilled water pumps, condenser water pumps and all associated piping throughout the entire building were replaced. The controls were updated to DDC controls with electric actuation. All new valves, dampers temperature sensors etc. that were replaced and integrated into the CCPS central automation system. Phasing considerations were a very important part to this project as a Performing Arts Addition & Renovation project had just begun at the school (also designed by BKM) and the construction timelines overlapped. A number of phasing discussions occurred throughout the project with CCPS to ensure that there would be minimal disruptions between the projects. An in depth phasing plan was developed based on these discussion to clearly outline the scheduling between the two projects. In addition, phasing guidelines considered when funding was available.

K-12 Portfolio



BKM provided MEP design services for the phased renovation of Jacksonville Elementary School, updating classrooms, administrative areas, and large spaces for a 650-student facility.

The project replaced aging HVAC systems with an air-cooled chiller, dual-temperature pumps, RTUs, DOAS units with energy recovery, and FCUs, while electrical systems were upgraded with VFDs and lighting was replaced with LED fixtures and digital controls.



BKM served as the prime consultant to replace the two original 1,400 MBH boilers in the 2006 addition at Northwest High School with new Riello units, along with associated heating water piping, gas piping, and boiler intake/flues.

The project followed an expedited schedule to ensure installation was completed before the heating season. This upgrade improves system reliability and supports long-term operational efficiency.



Quince Orchard High School is an existing three story high school with a dual temperature system serving multiple air handling units and fan coil units.

BKM led multiple projects at this facility over a ten year period, which resulted in a full replacement of all HVAC equipment. The projects also included necessary structural, electrical, and fire alarm upgrades for code compliance.



Harford Tech High School, a four-year vocational school with diverse technical programs, is undergoing a full HVAC system replacement that includes adding two new air-cooled chillers to convert areas previously served by DX units.

Because portable classrooms and swing space are not feasible due to the technical aspects of the spaces, the project required highly coordinated phasing with the design team, construction manager, principal, and owner.

The Park School | Pikesville, MD

BKM served as the MEP consultant for the Park School Science and Technology Addition, a 16,000 SF with 2,500 SF of renovations to the existing facility. This project achieved and is currently operating at net-zero energy usage, includes a new addition featuring four science classrooms with associated prep spaces, as well as specialized areas for electrical engineering, metal, and wood shop programs.

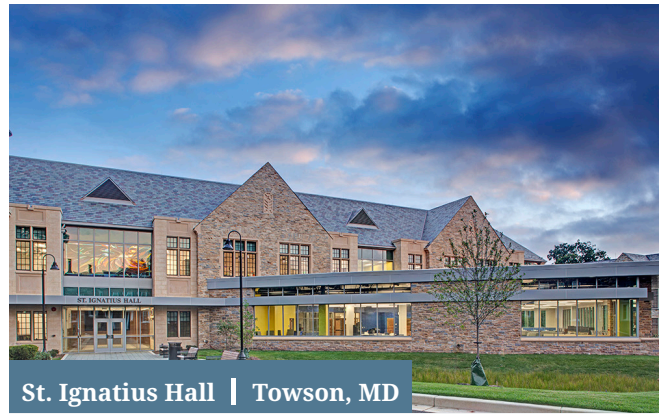
The engineering and shop spaces are equipped with advanced tools and equipment, including welding booths, soldering stations, various saws, mills, laser cutters, and 3D printers, to support hands-on technical learning. The HVAC system for the building is an air-cooled VRF system paired with a DOAS for proper ventilation, while fume hoods in the science classrooms are served by variable air volume exhaust fans and a make-up air system to maintain energy efficiency. All HVAC equipment utilizes heat pump technology with backup electric heat where needed, and a building automation system tracks energy usage to help verify the net-zero operations. The electrical distribution system consists of a dedicated 500A, 480Y/277V service, supplying power to lighting, receptacles, shop equipment, and mechanical systems. An extensive photovoltaic system was provided on the roof of the addition and existing building. **Design: 2022, Construction: 2024, Cost: \$12M**



Stone Ridge | Bethesda, MD

This project consists of a 5-story approximately 25,600 SF addition and a systemic renovation to approximately 48,000 SF of the existing school to a STEM school located in Bethesda, Maryland.

The school will be all electric and will include a highly efficient VRF/DOAS system as well as a make up air system to serve multiple fume hoods in the building. Gas turrets and a vacuum exhaust system will be provide in select classrooms, as well as a deionized water system. **Design: 2026, Construction: 2028, Cost: \$36M**



St. Ignatius Hall | Towson, MD

BKM served as the MEP consultant for the 38,000 SF Loyola Blakefield Innovative Learning Center, a multi-story facility with classrooms, labs, arts spaces, and a large green roof.

The HVAC system features a heat recovery VRF system paired with DOAS units, rooftop equipment screening, and condensing boilers for perimeter heating. Electrical included new 1,600A service, generator support for IT systems, and programmable lighting controls meeting energy code requirements. **Design: 2019, Construction: 2022, Cost: \$21M**

Matthew D. Sol, PE
Principal, K12 Market Sector
msol@bkma.com

bkma.com

bk m