



Historic Building

CLEAN BUILDINGS CASE STUDY

Historic Davidge Hall Executes HVAC Retrofit



Background

Project Goal:
Preserve Davidge Hall’s history while ensuring occupant comfort

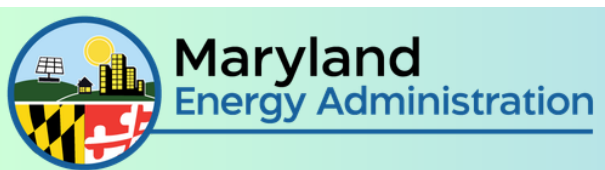
“Historic building decarbonization renovations require a fully engaged project team to successfully achieve the desired end-result.”

Kevin Smith, Associate Director, Mechanical

Built in 1812, Davidge Hall is the flagship building of the University of Maryland, Baltimore (UMB)’s medical school located in downtown Baltimore. The multi-purpose building houses two large lecture halls, offices, conference rooms, and a museum.

For nearly half a century, Davidge Hall’s heating and cooling was provided by the campus’ central chilled water and district steam systems. In 2023, the building’s HVAC system no longer provided adequate environmental control and did not meet modern code requirements, necessitating a system replacement.

The system’s end-of-life presented an opportunity for the university to explore efficient and electric HVAC alternatives - all while preserving the building’s historic integrity, which was a top priority for the university.



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Project Components

HVAC Replacement: UMB opted to replace aging air handling units, ductwork, and water piping with a variable refrigeration flow (VRF) system. These systems provide electricity-based heating and cooling, with the added benefit of precise, individual control and high levels of efficiency. Sixteen units were installed to condition the two large lecture halls, and smaller units were used to heat and cool the remaining offices and additional spaces. Indoor units are served by air-source heat pumps mounted on the roof of a neighboring academic building.

Electrical Upgrades: To accommodate the new electric HVAC system, UMB upgraded distribution equipment, electrical panels, breakers, conduits, and wiring. All upgrades are connected through a building automation system, which provides real-time system monitoring and controls.

Results

Beyond onsite emissions reductions, the retrofit allows Davidge Hall to maintain comfortable temperatures and humidity levels across all rooms. The new system is quieter and more efficient than the previous systems. Crucially, UMB's Office of Operations and Maintenance reports that the building's overall energy usage has decreased by 20 percent since the renovation.

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