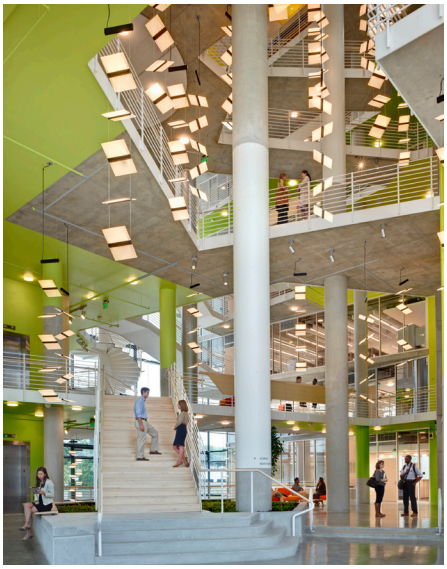
ON POINT

John Morris, PE
Project Manager

AN INTRICATE PUZZLE

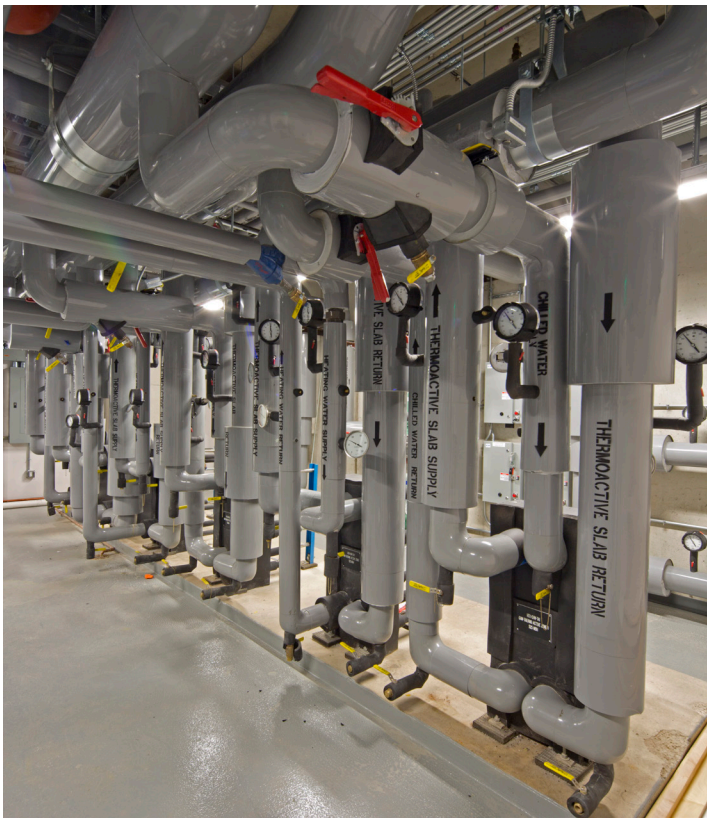
THE UNIVERSITY OF BALTIMORE LAW SCHOOL

In 2008, Mueller Associates was selected as part of the Behnisch Architekten/Ayers Saint Gross team to design the mechanical systems for the new University of Baltimore Law School. Mueller Vice President John Morris, PE, led the engineering effort for this innovative, award-winning project, which opened in 2013.



Q: YOU'VE BEEN A MECHANICAL ENGINEER FOR MORE THAN 25 YEARS. HOW DOES THIS PROJECT RANK IN TERMS OF COMPLEXITY?

A: It's certainly [one of] the most complex projects I've ever worked on. The design was very ambitious in terms of the sustainable strategies and Behnisch's objective of keeping the spaces very clean and streamlined. The basic design of the building, with its interlocking forms, has been described as a puzzle, and for us, integrating the mechanical systems into the spaces was like an intricate puzzle as well. At 12 stories and 192,000 square feet, it was also a very large project to manage.



Q: WHAT SETS THIS BUILDING APART FROM OTHER LARGE PROJECTS YOU'VE WORKED ON?

A: There are several features that made this project both interesting and challenging. One is the thermally active (radiant) slab flooring, which is used for both heating and cooling. This is a little more common in Europe but hasn't been implemented on many U.S. projects. The slabs were 11 inches thick and there was a lot of infrastructure to accommodate there—electrical conduit, PEX tubing, security conduit, and so forth. The automated natural ventilation system is another key feature. There was a lot of testing to be sure that everything worked properly in terms of humidity control. The windows in the curtainwall system open and close automatically depending on outdoor ambient temperature and relative humidity.

Q: ARE THERE OTHER BUILDING INNOVATIONS THAT YOU WERE WORKING WITH?

A: Yes. The automated shade control system is an important feature of the building from a climate control perspective. There are operable shades along the façade between the curtainwall and the rainscreen system. Solar sensors on the roof track the sun's radiation and trigger the automatic opening closing of the shades to control solar heat gain. Also, if the wind speed becomes too high, the shades automatically retract to prevent damage.

Q: MUCH OF WHAT YOU DESCRIBE IS AUTOMATED—CAN PEOPLE JUMP IN AND CONTROL THE SETTINGS AS WELL?

A: Yes, the building is designed to be "smart," but there is a lot of flexibility. The audio-visual system is tied into the shade control system, for example, allowing for manual adjustments in the amount of natural light. In private offices, occupants get a signal—a green light when ambient environmental conditions are favorable—that lets them know that they can initiate natural ventilation themselves by opening and closing windows.

Q: ARE THERE OTHER SUSTAINABLE ASPECTS RELATED TO THE MECHANICAL ENGINEERING?

A: There is a dedicated outdoor air system with a heat recovery wheel and a passive desiccant wheel that helps drive down the humidity level. The energy recovery wheel utilizes exhaust air to preheat or pre-cool the outdoor air as necessary. Other sustainable features include high-efficiency chillers and boilers, water-conserving fixtures, and a rainwater harvesting system.

Q: HOW IMPORTANT WAS BIM TO THE DESIGN OF THIS BUILDING?

A: BIM really helped to facilitate the design. Whiting-Turner, the construction manager, created BIM models of the slabs, which was important. All of the modeling helped with the intricate integration of the systems with the structure. There are a lot of exposed concrete finishes in this building and BIM helped us create a clean look.