



BACKGROUND

Located in Arnold, Maryland, the Anne Arundel Community College (AACC) main campus was originally constructed in 1967 and now consists of 30 buildings totaling 872,000 gross square feet. Lutz Engineering has provided engineering design and commissioning services to AACC for more than 15 years. Projects have included the creation of a BAS master plan and the design, implementation oversight and commissioning of new building automation systems (BAS) for several buildings on campus.

Prior to Lutz Engineering's involvement with the college, the campus had utilized a sole-source proprietary building automation system that was increasingly expensive to maintain, repair, and upgrade. Lutz Engineering has assisted with AACC's migration from the proprietary building controls to a system that is competitive and allows the utilization of open communication protocols and web-based user interfaces. Lutz Engineering has created Building Automation System User Guidelines and Specifications. In 2015 Lutz Engineering worked with AACC to develop an RFP for On-Call Controls Contractors to help streamline the selection process for the college's ongoing control upgrades.

ENGINEERING DESIGN SERVICES

Cade Center for the Performing Arts Anne Arundel Community College



DESIGN PROCESS

The original Cade Building Automation System (BAS) manufactured by Trane had reached the end of its useful life. The hardware and software were 'orphaned' by the manufacturer, parts were no longer available for purchase, and there are a very limited number of technicians who are able to provide technical support. AACC determined that the BAS for the major equipment should be replaced and the terminal equipment should be integrated into the new communications architecture designed by Lutz Engineering utilizing the campus network.

Another goal of the project was to reduce building energy use and to incorporate energy metering to validate the changes that were made. VFD's and high efficiency motors were added to the HVAC, occupancy sensors were added to shut down VAV terminal units in dance studios and concert rooms, and the sequence of the ice storage system was revised to optimize ice use and to reduce wear and tear on the chiller.

For the Cade Building BAS replacement, Lutz Engineering performed the following activities:

- Collected and reviewed existing Building MEP and Building Automation documentation.
- Developed a full design package including mechanical plans and specifications, sequences of operation, detailed points lists and control drawings, and control flow diagrams.
- Prepared a detailed Scope of Services for inclusion in an RFP for BAS contractors.

- Supported preparation of the RFP and purchasing activities during the bid process.
- Provided Construction Administration services as the Engineer of Record – responding to technical questions, participating in progress meetings, and conducting site visits throughout the construction process.
- Provided commissioning services, including 100% Functional Testing of the HVAC equipment.
- Conducted Operator Training for the new system.

PROJECT CHALLENGES

Partial BAS replacement – existing terminal unit hardware was to be re-used. To replace the terminal equipment controllers would have increased the project cost by nearly 50%. The existing, 20 year old controllers and end devices were operating reliably, and communications drivers existed to provide an interface to the new BAS, however, replacement controllers were not readily available. In order to create spare control hardware and to introduce new terminal unit controls into the building, a half-dozen existing controllers were replaced with new BACnet controllers.

Ice Storage System Controls – The existing ice storage system controls had not been designed or installed properly, and therefore the design intent was not being met. Lutz Engineering re-sequenced the plant and the primary building AHU to effectively utilize the existing equipment and to save cooling energy.

