Missouri State University is the state’s second-largest educational institution. The School of Music, a modernist structure erected in 1957, is dedicated to the practice, performance and theory of music and defines the southern edge of the college quadrangle. With no major renovations since its construction 60 years ago, the aging features and systems of the building were in notable need of updating. Despite a limited budget for the full-building renovation, Missouri State University still wanted the final product to be one that would provide a modern facility for their current musical students as well as draw new students to the college. Many improvements were made to achieve the university’s vision, including the transformation of the recital hall and efforts focused on maximizing energy conservation throughout the building.
**PROJECT DELIVERABLES**

Restoring a building under tight budgetary constraints whose last major renovation was over 60 years ago provided quite a few challenges. We were up to the task and worked closely with the architect and owner to develop several innovative solutions for the building improvements. These would ensure the creation of a center that would continue to serve the Missou-ri State University community for another 60 years.

One of the major aspects of the renovation was the conversion of the existing recital hall from a single-story general use auditorium to a two-story performance space. With this transformation, our team was tasked with finding an effective way to maintain specialty temperature and humidity conditions in a larger area with a limited amount of mechanical space. This was achieved by completely replacing air-side heating and cooling systems. In addition, the existing campus chilled water and steam plants were re-utilized as a source for the building's cooling and heating. A new makeup-air unit was installed to pre-condition most of the outdoor air entering the building. This unit not only provided for improved pressurization control of the building, but also allowed for superior humidity control. By using chilled water from the campus plant, the team avoided lower-efficiency DX cooling equipment. Additionally, by de-coupling the building outdoor air via the makeup air unit, simultaneous heating and cooling was significantly decreased from the previous HVAC systems.

With an increased amount of glazing in the building, thermal loads would have threatened to require larger mechanical systems. McClure Engineering was tasked with finding a way to keep both the mechanical systems and new glazing within the tight budgetary parameters. Our team worked closely with the architect to optimize thermal properties of the new glazing. By focusing the thermal properties with the greatest effect on each building face, we were able to help keep the initial glazing costs down and minimize the capacity of the new HVAC systems.

Building heating and cooling loads were additionally decreased with the added layer of thermal insulation as part of the new roof assembly. While the new roof was primarily under the purview of the architect, we pushed hard to make sure the thermal performance of the roof and windows was maximized within the budget to prevent increases to overall building heating and cooling loads. Additionally, lighting within the building was updated to LED fixtures to optimize low energy consumption.