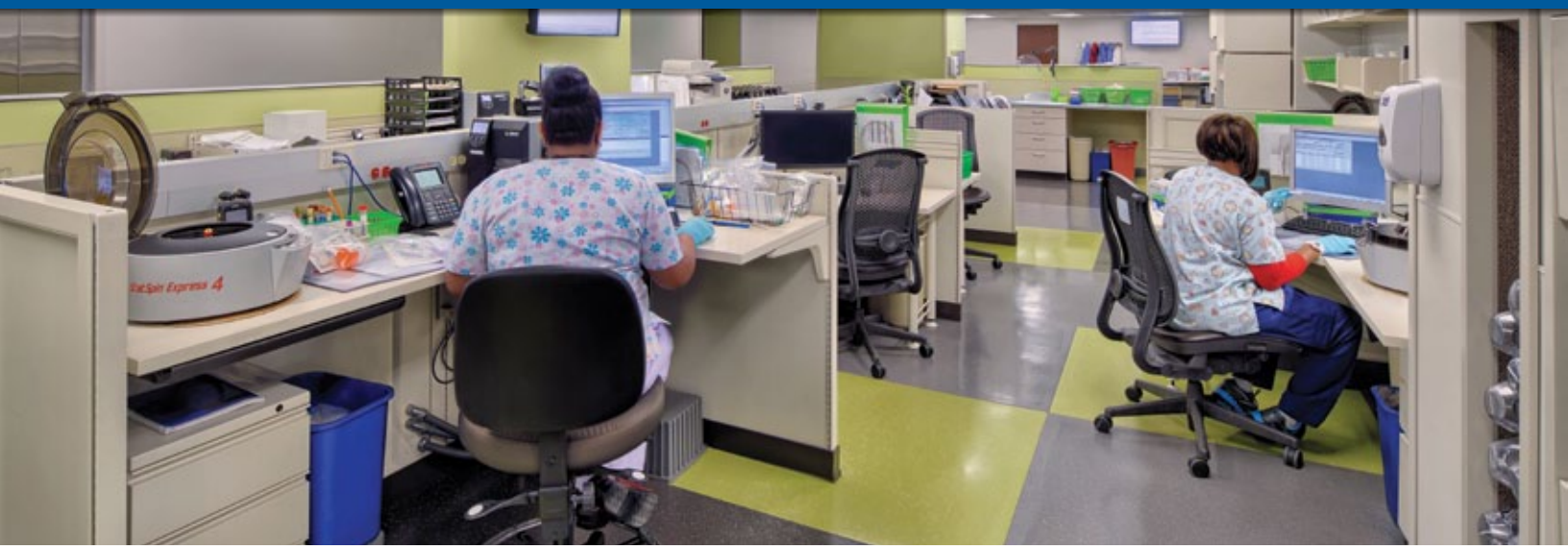
DIAGNOSIS: REDESIGN

Lab Renovations Improve Work Flow, Increase Security



Background

Saint Luke's Hospital of Kansas City is one of the area's longest-serving hospitals. As the flagship of the Saint Luke's Health System serving the entire Kansas City, Mo., metropolitan area, Saint Luke's Hospital has seen unparalleled growth in its more than 125 years. Expansions, retrofits and renovations to various units of the original hospital have helped doctors, nurses and other caregivers do their jobs better, increasing patient satisfaction.

But the lab — arguably the most critical unit of the hospital for its diagnostic role — was last expanded in 1963 and needed renovations to keep up with changing technology and new testing techniques. Lab access needed tighter restrictions, and the flow of specimen testing was inefficient because of space constraints. Because previous plans for renovations had not come to fruition, the need was urgent.

Challenges

Aside from the age of the lab, the space it occupied was relatively small. Ceiling heights were barely 7 feet, and expansion was limited by adjacent areas occupied by other hospital departments. Several pieces of laboratory equipment were not only large — over 9 feet long in one case — but are frequently replaced, creating challenges with system requirements, including power, ventilation and plumbing, as technology advances and testing techniques improve. The layout needed to be spacious enough to accommodate full-time staff during normal hours of operation, yet not so spread-out that the nighttime and weekend staff could not work efficiently.

The lab is the diagnostics hub for the entire Saint Luke's Health System. In all, the health system operates seven hospitals in the Kansas City metro area. While most have small-scale labs on-site with lab scientists who can collect samples, those labs are not equipped to perform all the testing that may be needed. Couriers require regular access to the Saint Luke's Hospital lab to drop off samples and replenish supplies for the facilities they serve. But perhaps the biggest design and planning challenge was construction phasing and the subsequent funding schedule. While the total project budget of $8 million — $6.2 million for construction — was known from the start, it was allocated over three years. That meant the construction schedule had to be broken into segments that would accommodate each funding allotment and construction and laboratory function phases. Throughout the entire project, the lab had to remain 100 percent operational, around the clock.

Solution

Burns & McDonnell took an all-in approach to developing the best work plan. The entire design team, including architects and mechanical and electrical engineers, became familiar with the lab equipment system requirements to best understand their functions and roles. Lab personnel provided insight to their needs related to work flow, movement of specimens, and proximity of equipment and laboratory functions. The integration of a "main street" corridor kept housekeeping and delivery carts out of the main lab areas, and the use of low-profile light fixtures allowed the ceilings to be flush with the fixture face, giving the lab a continuous, open feel.

"The Saint Luke's lab personnel were very thorough and responsive to our questions about equipment and lab function," says Gilda Viets, project manager for Burns & McDonnell. "There were hundreds of pieces of existing equipment to relocate,

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and it all had to be identified for operational requirements. We worked to provide adequate service where we needed it, whether temporarily or in the final location, for every piece of equipment."

Burns & McDonnell worked closely with JE Dunn Construction and Saint Luke's Construction & Facilities Management from the beginning through completion of the project. Coordination and communication at weekly construction meetings kept all parties aware of the construction schedule and facilitated quick solutions for unforeseen field conditions. One example of this team collaboration occurred at the conclusion of one phase of construction. An adjacent expansion space was vacated early, allowing the team to rearrange the order of the phases and complete that portion of the project sooner.

"The Burns & McDonnell team really listened when we said what we needed to do our work," says Kristy Gibson, laboratory services system director at Saint Luke's Hospital. "They were extremely organized and detailed — thinking ahead to potential roadblocks we wouldn't even have thought of and planning solutions."

The design team used three high-end technology resources: Revit Architecture, Submittal Exchange and laser scanning. Revit assisted in drawing construction phasing in sequence, greatly improving demolition and construction drawing clarity. Submittal Exchange, a comprehensive online system for exchanging, reviewing and archiving construction documents, allowed the design, construction and hospital teams to find all submittals, responses to construction inquiries, and the most current construction documents in one location. A laser scan documented existing field conditions.

"Laser scanning and checking the architectural model against the scanned existing conditions allowed us to see unexpected conflicts and address them before the contractor submitted a request for information. This efficiency helped keep the construction process smooth and on schedule," Viets says.

Outcome

Now Saint Luke's Hospital has a transformed lab that meets the needs of new laboratory technology, improved work flow, operating efficiency for the staff, and a long-overdue security system in place.

"The icing on the cake was an instrument evaluation area," Gibson says. "New equipment often requires setup, calibration and evaluation before being put into service, so having that available makes installation much easier."

Lab personnel have unobstructed views from one end of the lab to the other, improving communication among staff. Equipment is more logically located to make movement between machines easier, safer and less time consuming. A new break room — a nice addition considering no food or drink are allowed inside the lab — and larger, accessible restrooms are centrally located for lab personnel convenience. For added safety and security, couriers now enter a code to access the specimen drop-off/pick-up room, and a notification system has been installed to get specimens in the lab quickly.

"This project just completely turned the area into something so much better," Gibson says. "We've had numerous comments about how wonderful the new lab is."

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Saint Luke's Hospital's newly renovated laboratory makes equipment more accessible and work flows easier.