



Profile

Staking claim

By Amy Eagle

Organization opens hospital in Arizona boom town

Project Name / Mercy Gilbert Medical Center
Location / Gilbert, Ariz.
Owner / Catholic Healthcare West
Total Floor Area / 358,650 square feet
Number of Floors / Four
Project Cost / \$155 million
Construction Cost / \$80.6 million
Groundbreaking / March 2004
Opening / June 2006



For the past five years, the population of Gilbert, Ariz., has grown at an average rate of more than 1,000 new residents per month. The Phoenix suburb has attracted this astounding number of people with its appealing climate, setting and economy, but until recently the town lacked one crucial feature—a hospital.

San Francisco-based Catholic Healthcare West (CHW) saw the community's need and realized the competitive advantage to be gained by being the first to open a local hospital in Gilbert. Last June, the not-for-profit health system did just that, with the opening of the 92-bed Mercy Gilbert Medical Center.

"We knew the competition was building," says Laurie Eberst, R.N., chief executive officer of Mercy Gilbert. Eberst says CHW wanted to establish Mercy Gilbert before another hospital opened in town. Also, she says, the health system wanted to be ready to serve patients before the winter season, during which shortages in bed and emergency department capacity were chronic in the fast-growing Phoenix area.

Streamlined process

Working with Moon Mayoras Architects Inc., San Diego; engineering firm Syska Hennessy Group, Los Angeles; **structural engineers Chavez-Grievés, Albuquerque, N.M.**; and Kitchell Contractors Inc., Phoenix, CHW was able to meet both of these goals in quick order. Only three years passed between the time the land for the hospital was purchased and the time the doors opened.

"It's probably been one of the smoothest opening and construction processes that I've ever heard of," says Eberst. The project was so efficient in part because all the major parties involved were brought on board as early as possible. These included not just the owner, architects, engineers and construction manager, but local government officials, subcontractors and the hospital's future facilities manager, as well. Gaining everyone's input up front helped the design and construction team dovetail all the pieces of the project.

Team members met with officials from the town of Gilbert during preconstruction talks to discuss how to streamline the inspection process. The community was "a tremendous help," says Dave McDermed, senior project superintendent for Kitchell. To help the fast-track project proceed without delay, the town hired representatives from Canadian design and consulting firm Stantec to conduct the project's plan check and building inspections.

Early meetings with utility company officials helped ensure utilities were operational by the hospital's opening date. "We were fortunate that the building site was pretty wide open," says McDermed. But the openness of the site, a former alfalfa field, also meant that sewer, water, power, telephone and gas lines had to be brought in from a distance. "We worked with the local utility companies very early on to get us into their overall area plans," McDermed says.

The schematic plan used for Mercy Gilbert was originally based on two prior CHW hospital developments. Adapting this plan to the Gilbert site gave the project somewhat of a head start. Kitchell personnel were familiar with the overall building size and scale, having worked on the two previous hospitals.



There was still, however, significant design work to be accomplished. The original plan was created for a split-level parcel of land, so major portions of the building had to be redesigned to suit the flat Gilbert site. The hospital's diagnostic and treatment area, which in the original design was situated on a lower level, was moved up a floor. "[We] essentially redesigned the entire facility with the exception of the patient bed tower to accommodate that change," says David N. Moon, AIA, FACHA, of Moon Mayoras Architects.

To uncover any shortfalls in the schematic, the team interviewed the chief engineer at the first hospital built to this design. "[CHW] wanted to apply any lessons learned to this project," says Paul Dong, P.E., a Syska Hennessy mechanical engineer. As a result of these conversations, several enhancements were made to the design, such as a more efficient pumping system and shorter cabling runs.

CHW also used a process called design-assist for the mechanical, electrical and plumbing (MEP) portions of the project, bringing the general contractor and subcontractors in to collaborate with the architects and MEP engineers during the design phase. This helped the team select and size the building's infrastructure components.

Mercy Gilbert's facilities manager, Paul Lyons, was also consulted early in the project, a tactic McDermid says not only aided in equipment selection and systems design but also helped iron out maintenance issues before the building opened.

Using a design-build approach for the steel portion of the project made it possible for the project team to determine the proper sizes for steel supports and complete the structural steel design and procurement early. And, says McDermid, "It helped eliminate a lot of change orders throughout the process. When it came time for construction we could move fairly quickly."

Occasional adjustments had to be made to the construction schedule due to the accelerated pace. Moon says, "The job went up so fast, for example, it took a lot longer to sequence the concrete drying out to put flooring material down. Some things were tricky. But I think the team was very good about trying to resequence as they needed to adapt to changes."

To allow CHW staff to take advantage of the latest possible technologies in major medical equipment without delaying construction, Kitchell staff worked around rooms where that equipment was to be located. "We had empty shell rooms with dirt floors, where on the other side of the wall you had final finishes such as floor tiling and paint on the walls," says Pat Watson, project director for Kitchell.

Efficiency counts

The hospital was not only built efficiently, it was built to run efficiently. For instance, the hospital's chilled water system uses only one set of pumps. In a conventional setup, two sets are used, one to move water around a primary loop and another to pump the water between that loop and the building, as a secondary loop. "Instead of running circles in the building, we pump through the chiller, go into the building, and then come back directly," says Dong. The longer run requires higher pressure pumps; however, these pumps can operate at more efficient variable speeds. According to Dong, the variable speed primary pumping system provides a big first-cost savings on equipment, plus ongoing operational and maintenance savings. Energy efficient chillers and variable-speed cooling towers add to the building's efficiency and cost-effectiveness.



Dong explains.

For heating, the hospital has a nonflashing high-pressure condensate return system that saves the heat generally lost during the water return process. The high pressure water that condenses from a steam heating system is normally dumped into an open flash tank, from which 20 percent of the high pressure condensate's heat can be lost due to vaporization. This water must then be returned to the boiler and reheated to steam. At Mercy Gilbert, the high-pressure condensate is put into a feed water system that is designed to handle the high pressure. Without an open tank, the high-pressure condensate cannot vaporize, so there is no corresponding heat loss.

The air flow system in each of the hospital's operating rooms has an unoccupied mode setting that reduces the number of air changes that occur when the rooms are not being used. During regular operation, the system provides 20 air changes per hour. In unoccupied mode, this is lowered to six air changes per hour. "We slow down the fans to save energy,"

The operating rooms also have both high and low air returns to minimize surgical infections, in accordance with new recommendations in the 2006 Guidelines for Design and Construction of Health Care Facilities, commonly known as the "AIA Guidelines." The 2006 guide had just been published and was not even on the market when the hospital was built.

Other innovations at the hospital include a volumetric method of monitoring negative pressure isolation rooms. Dong says this system, which constantly measures the rooms' supply and exhaust levels to make sure negative pressure is maintained, reduces the number of false alarms that can occur with conventional pressure sensors. And instead of using boiler steam, which can contain chemicals, the hospital's sterilization system uses chemical-free "clean steam" that is injected directly into the sterilizer. At a lower pressure, this same steam is used to humidify the air in such areas as operating rooms and the intensive care unit.

Local color

Although speed and efficiency were major issues on the project, these factors did not override aesthetic concerns. "We wanted [the hospital] to stand out, and not just be a big, white boxy building," says Eberst. "We wanted it to complement the architecture around us."

"There are some great [architectural] icons in downtown Gilbert, particularly with their train station," says Moon. To help visually tie the building to the surrounding community, the architects incorporated interpretations of some local structures into their adaptation of the hospital design. The train station's barrel vaulting is referenced in the design, along with other shapes and forms from the downtown area.

The natural setting was also a consideration. Architect Douglas A. Mayoras, AIA, ACHA, says the colors chosen for the building, particularly its exterior stone wainscoting, are designed to reflect the richness of the Arizona's sunsets.

Exterior windows and skylights fill the building with sunlight during the day. "We tried to take advantage of all the light," says Mayoras. "It's a bit of a trick because it's 115 degrees out there in the summertime. We tried to help people enjoy the outdoors and natural light without necessarily exposing them to the sun." Thus, smoked glass domes provide sufficient light without the glare, and a custom lattice shades the rooftop deck.

Xeriscaping, a landscaping technique that conserves water, surrounds the hospital with plants that thrive under desert conditions. "It's just beautiful," says Eberst. The town of Gilbert apparently agrees; the community honored the hospital with a 2006 beautification award.

The new building's look, layout and technology, as well as the culture of healing CHW is working to establish at Mercy Gilbert Medical Center, have made the hospital easy to staff, Eberst says.



The health system had been concerned about staffing, especially as Arizona is second only to California in the lowest number of nurses per capita. A plan was developed to recruit nurses from overseas, but it turned out to be unnecessary. A job fair held six months prior to the hospital's opening—an event organizers expected to attract a couple hundred applicants—drew more than 1,200 people. "It was phenomenal. I had full staff on opening," Eberst says.

More growth ahead

CHW is already working on an expansion project at the hospital, which was designed with the community's growth rate in mind. One wing was shelled for future development, the central plant was positioned to allow for new construction and the hospital's infrastructure was sized to support more space. Plans are in place that will allow the hospital eventually to double in size.

"We sit on 60 acres, so we have plenty of land to expand and continue to meet future needs," says Eberst.

As needs change, the interior of the building will be able to change with them. Shafts and piping on the patient floors are positioned so that rooms can be converted from, for instance, medical-surgical to intensive care rooms. "We can change the acuity level depending upon the program and needs of the hospital at any given time," says Carol Fern, P.E., Syska Hennessy's vice president/group manager for health care. In the diagnostic and treatment area, systems were placed on the exterior of the building to create large open spaces within which medical departments can easily be rearranged.

Eberst says the town of Gilbert has welcomed the new hospital with "a tremendous amount of support and warmth," as well as the resources to continue facility development. In the past year and a half, the hospital has raised \$5.6 million toward a \$10 million capital campaign to provide for future growth.

Which, in Gilbert, seems a given.

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This article 1st appeared in the January 2007 issue of Health Facilities Management Magazine.