

a modular PERSPECTIVE

Hospitals that run out of space can find solutions from modular building tactics

By Jim Gabriel

Bridgeport Hospital had a space problem. The Bridgeport, Conn., location had committed to becoming the first healthcare facility in southeastern Fairfield County to offer hyperbaric oxygen therapy with a new, state-of-the-art hyperbaric oxygen chamber. One problem: The hospital had no room to house it.

But thanks to the creative use of modular space, it now has a cutting-edge facility for one of the nation's most advanced therapies. And it learned some important lessons along the way that can help other organizations find space where they think they have none.

Hyperbaric oxygen therapy is a relatively new treatment for difficult-to-heal wounds, such as leg ulcers from poor circulation, bed sores, diabetic foot ulcers, burns, scars, surgical wounds, traumatic injuries, chronic bone infections, and radiation-damaged tissue or bone.

Patients typically undergo 20 to 40 two-hour therapy sessions inside a hyperbaric chamber. The chamber pumps in oxygen at a significantly higher level than standard atmospheric levels. Repeated exposure to pressurized oxygen boosts the effects of some antibiotics, activates white blood cells to fight certain infections, and promotes the healing process of chronic wounds due to increased oxygen pressure in tissues and blood.



Bridgeport Hospital in Bridgeport, Conn., went the modular construction route in order to house a new hyperbaric oxygen chamber.

Bridgeport purchased a specialized hyperbaric chamber that could accommodate up to 12 people at a time, as opposed to the traditional one-person chamber. However, Bridgeport didn't have anywhere to put it. It needed a facility with a foundation system and utilities that would adjoin the hyperbaric chamber facility with the hospital, creating a seamless patient care environment.

Finding a solution

Bridgeport wanted to ensure it was creating a space that was easy for patients and staff to maneuver when walking between the Wound Healing Center and the hyperbaric oxygen center. And the hospital needed it quickly, without increasing its capital budget expenditures.

That's why Bridgeport decided to go modular, knowing that today's modular spaces are a far cry from galvanized metal roofing and aluminum-sided exterior walls that typified modular buildings in the past. Done right, modular facilities look and operate like their conventionally-built counterparts.

Bridgeport spent several weeks conducting research to determine whether such a hyper-specialized space was

feasible with modular construction.

The hospital team worked closely with MedBuild's engineers to coordinate details of the modular solution. MedBuild designed and assembled four 14-by-16 modules at its factory and transported them to Bridgeport's site. The new building was assembled on-site, connecting the chamber to the hyperbaric facility using an enclosed corridor. The building design also included exam rooms and a large waiting area for patients and family members.

Several unique design features were incorporated into the building. An engineered perimeter foundation with crawl space access and ventilation system was created, and sustainable features such as energy-efficient windows and an EPDM roofing system also were used. A specially-engineered HVAC system was installed allowing for 15 air changes per hour.

The entire facility was completed within five months of the project start date, on time and on budget. Most importantly, Bridgeport's new facility is a boon for patients in the hospital's Wound Healing Center. It now is recognized by the national medical community as a leader in advanced medical technology.

Visalia Medical clinic also looks to modular solution

Visalia Medical Clinic in Visalia, Calif., was leasing a mobile imaging trailer from an imaging company, and it wasn't cheap. The clinic knew it needed to replace the trailer with a fixed site building solution to house its new 1.5T MRI magnet from Siemens.

Visalia was faced with a dilemma that many hospitals encounter. The demand for its expanding medical facility capabilities was outgrowing its current space.

A permanent imaging building addition for the medical center — as opposed to a mobile imaging center that was being brought to the medical center on an as-needed basis — proved to be a cost-effective solution for Visalia Medical Clinic.

As with every expansion project, Visalia brought its own unique standards and challenges to the table. For example, its new imaging building had to be set within one foot of the existing hospital facility and have the entry door connect to the existing waiting room for the hospital. A small portion of the exterior of the new

way for the medical center to expand its imaging capabilities, therefore generating more revenue for the medical center.

The new imaging building for Visalia Medical Clinic is a steel and concrete structure with the radio frequency and magnetic shielding pre-installed in the factory. The mounting bolts for the Siemens magnet were installed in the factory prior to the building shipping to site using a pre-made bolt pattern template.

Expecting the unexpected

But what about healthcare providers that are forced to take on an unexpected construction project due to an unforeseen need? If a storm causes major damage, for example, hospitals — and patients — can't afford to be left in the dark. Rebuilding in areas of destruction often require a new approach to safeguard against future occurrences.

When the St. John VA Outpatient Clinic in Reserve, La., was destroyed by Hurricane Katrina in August 2005, more than 240,000 veterans were forced to seek care in temporary medical facilities.

which were minutes from the Louisiana War Veterans' Home. Once the location was finalized, MedBuild reviewed the VA's specifications for the new site and developed a design that fit all of the VA's and state's needs and requirements.

For example, the state requires that every building — modular and traditional construction — be able to withstand severe weather conditions, with winds up to 130 miles per hour. The building was designed to stand 4 feet above the existing grade and local floodplain.

Due to the site's soft, loose soil, the 114 piles were driven 50 feet into the ground. This deep foundation system ensures that the building will be supported, while resisting wind and flooding conditions. Meanwhile, 19 modular buildings were constructed at the factory in a quality-controlled environment.

Once all the piles were driven, and concrete pile caps and perimeter foundation walls were constructed, MedBuild set the modulares. The modules were welded to the foundation's embedded steel plates and the entire facility was assembled and watertight in less than five days. Finishing touches, such as rooftop air conditioning units, were added throughout the next few months.

The new facility includes a 78,200-square-foot paved concrete parking lot, nine examination rooms, three counseling offices, a waiting room, administrative offices, an employee break room and training space.

Today, St. John's is one of the nation's premier veterans' outpatient clinics. It is equipped to provide general patient care, mental healthcare and specialty care services.

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imaging building needed to connect to an interior wall of the hospital around the main entrance door in order to connect to the existing waiting room.

Because the new facility would house a sensitive piece of diagnostic imaging equipment, specific requirements also needed to be in place. The building needed to include both radio frequency and magnetic shielding — also known as electromagnetic shielding — to block radio frequency electromagnetic radiation. Finally, the interior needed to accommodate separate scan and control rooms.

The solution not only was able to seamlessly integrate with the existing medical center, but it also was a faster

Makeshift medical offices were set up in tents in parking lots, Veterans of Foreign Wars' halls and retirement homes.

The long process of rebuilding the Gulf Coast had started, but the area's veteran community needed adequate medical care immediately. The Department of Veterans Affairs contacted MedBuild to create a permanent, high-quality, multifunctional modular facility to replace the former VA Outpatient Clinic.

The U.S. military and the Department of Defense have been proponents of the use of modular buildings for their quick deployment and ability to easily relocate.

To house the new facility, St. John Parish officials donated five acres of land,