Advances in design and construction methods are enabling many hospitals and systems to deliver quality new facilities faster and at a lower cost than in years past.

By Todd Reynolds

Although the ultimate fate of healthcare reform remains in doubt, at least one thing appears certain: providers will need to reduce costs, maximize efficiency, and defend and expand their market shares to remain competitive—all while continuing to deliver accountable, high-quality care. That’s a tall order, and it affects every aspect of organizational strategy, including facilities.

Fortunately, advances in design and construction methods are enabling many hospitals and health systems to deliver high-quality new facilities faster and at a lower cost. One system in the Pacific Northwest, for example, is leveraging these techniques right now to construct multiple new facilities in one-third less time and for one-third less money than if it used traditional project delivery methods.

Some of these techniques are relatively new, while others have existed for decades. But they are all finding increasing acceptance as healthcare providers look to the design and construction industry to help them more cost-effectively deliver quality care in this era of healthcare reform.

Let’s take a closer look at some of these innovations and how healthcare providers can benefit.

Integrated project delivery (IPD) and other innovations are enabling providers to build facilities quickly and cost-effectively while delivering top-notch care.

Integrated Project Delivery

Integration is a buzzword these days as healthcare reform has compelled hospitals to forge closer bonds with physicians in an effort to streamline the delivery of high-quality, high-volume, cost-effective care. Likewise, integration can also enhance development efforts.

The integrated project delivery method was initially developed in the mid-1990s and is still evolving, so definitions vary. However, IPD can be defined as a system that integrates people, systems, business structures and practices into a process that facilitates collaboration and information sharing throughout
the facilities design and construction process, resulting in greater efficiency and superior results. The three primary participants in the IPD process are usually the client, architect and contractor, although consultants, subcontractors, suppliers and other stakeholders often also participate.

When implemented effectively, IPD replaces the often adversarial relationship between architects and contractors with an environment of shared risk and reward. When challenges arise, the focus is on finding solutions rather than assigning blame. IPD can also be tailored to the most appropriate delivery method for a given client and project, whether that is design-build, construction management at-risk, or another approach.

The most dramatic differences between IPD and traditional project delivery methods can be found during the early stages of a project. IPD requires much higher levels of team communication and collaboration. The first phases of a conventional project delivery process are pre-design, schematic design, design development and construction document preparation. Historically, much of that work has been completed by the architect with little or no input from the contractor. Conversely, the first phases of IPD are conceptualization, criteria design, and detailed design and implementation documents. The contractor is intimately involved from the start in keeping with IPD’s more holistic and inclusive approach.

During those initial phases, the IPD team works collaboratively to outline what is to be built—including specifications, costs and schedules—and how that will be accomplished. The terms for the subsequent phases of the IPD process—project buyout (subcontracting), agency review (securing governmental approvals and permits), construction and closeout (finalizing the project)—are the same as those used for a traditional project delivery process, but the actual process is again much more collaborative. When developing new healthcare facilities, the effective implementation of IPD should result in buildings that cost less, are delivered faster and operate more efficiently than those built using traditional project delivery methods.

IPD also better supports objectives pertaining to sustainability-green building-than conventional methods, according to research studies. A 2009 report from the Design-Build Institute of America found that integrated delivery methods are superior in achieving or exceeding Leadership in Energy and Environmental Design (LEED®) certification goals. Those findings are not surprising. Maximizing sustainability requires integration of construction knowledge early in the design process—a fundamental element of IPD.

Building Information Modeling

Building information modeling is a key ingredient in what makes IPD possible. Like IPD, the definition of BIM continues to evolve. However, it can generally be described as a process that uses three-dimensional, dynamic building modeling software to enable project team members to more fully collaborate throughout the project delivery process.

The capabilities of BIM far exceed those of traditional computer-aided drafting to encompass massive amounts of information, including geometry, spatial relationships, light analysis, geographic information, quantities and properties of building components, such as manufacturers’ specifications. The ability to examine and manipulate a complete virtual representation of a facility and its operations enables team members to identify and resolve potential problems and opportunities before ever breaking ground, dramatically reducing change orders and redesign work.

The precision of BIM modeling software has also allowed certain complex facility components to be assembled off-site in controlled work environments and delivered to the construction site for seamless integration with other building components.
The benefits of BIM produce well coordinated projects that can be delivered more rapidly and efficiently, resulting in schedule and cost savings to healthcare providers.

Tilt-Up Construction

Although tilt-up is a construction method that has become pervasive since the post-World War II building boom, it is not one that has not been used extensively for healthcare facilities. But that could soon change.

Through the tilt-up method, building elements such as walls, columns and other structural supports are created in the form of reinforced concrete slabs. Those components are then placed near their final position horizontally, then literally tilted up into a vertical position and secured.

The obvious benefits of tilt-up construction are that projects can be completed more quickly and at a lower cost than through traditional ground-up construction methods.

However, early tilt-up buildings were easy to spot; those pioneering efforts tended to result in a drab, boxy appearance best suited to warehouses and industrial buildings. They were also limited to one or two stories in height. But recent advances in technology have made it possible to vastly improve the appearance, variety and height of tilt-up panels, making many such buildings indistinguishable from those constructed using other methods. Thus the tilt-up technique has become an increasingly viable choice for homes, offices, hotels, schools and healthcare facilities.

Aside from the time and cost advantages, another benefit of tilt-up construction is that once a prototype is created, facilities can be easily replicated at multiple locations while retaining the flexibility to respond to each unique market and its healthcare needs.

The Future of Project Delivery

The health system mentioned earlier in this article took advantage of all three of these proven innovations - IPD, BIM and advanced tilt-up construction methods to deliver multiple new facilities, including medical office buildings and freestanding emergency departments. These multi-story buildings were delivered in eight months rather than the 12 months that would have been required for traditional construction. Core and shell construction costs were $70 per square foot, a dramatic reduction from initial estimates of $135 per square foot.

In addition to simply saving time and money, this geographic expansion will enable the health system to make high-quality care more accessible and convenient for residents of a broader geographic area. Moreover, it will be able to do so with buildings that have a consistent look and feel throughout the region, in other words, branded facilities that are immediately recognizable as part of that system thanks to distinctive but standardized materials and other design elements.

And while system executives chose not to pursue formal LEED certification in this case, the efficiencies derived from the information sharing and close collaboration supported by these innovative project delivery techniques are enabling them to design and build some of the most energy efficient healthcare facilities in the region.

This is just an example of how IPD, BIM and other advanced project delivery methods are benefiting one specific provider. But more and more hospitals and health systems seem likely to embrace these innovations as the pressures mount to more quickly and cost-effectively bring quality healthcare to their existing service areas and beyond.

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