

# Smarter Healthcare Construction: Controlling Cost Inflation



## A White Paper

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**T**he cost of building and renovating healthcare facilities in California in the coming years will put a terrific strain on the entire healthcare delivery system—unless we can figure out ways to do quality work at less cost. The problem is growing, and we must address it.

According to construction consultants Davis Langdon, healthcare construction costs averaged \$330 per square foot in 2003 in California. That cost is forecast to be more \$1,000 per square foot in 2011. Stated another way, the California Hospital Association says it costs more than \$2 million per bed to build a hospital. What's driving these numbers, and how can we get a handle on them?

California builders operate under very stringent requirements because of laws requiring seismic safety and numerous regulations promulgated by the California Office of Statewide Health Planning and Development. A great many hospitals

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must comply with seismic standards or risk getting shut down. Seismically unsound hospitals can collapse on patients and healthcare workers. How much will it cost to upgrade our facilities? Nobody knows, but it's in the tens of billions. A Sacramento Bee article recently put the figure at more than \$100 billion.

Additionally, the medical system must soon accommodate millions more people under requirements of the new federal health-care law. And we are faced with mounting budget deficits at every level of government. All this will bring added pressure on the current healthcare infrastructure.

These are some of the problems. What are the solutions? The good news is that, in our years of experience, we and some other firms like ours with extensive healthcare construction experience have become smarter about the way we build hospitals. How?

There are many ways we can do more with less—and in less time than in the past, thanks in part to technology, better planning and more highly trained people in the design and construction industry.

Below is a checklist of the many ways healthcare facilities can be built smarter and at less cost without sacrificing quality or patient safety.



Photo courtesy of Kaiser

*A successful project starts with careful planning and an adherence to schedules and design decisions.*

ductive and determine what can be done to streamline the process and help reduce the cost of construction.

■ **Design-Build MEP.** MEP systems have to be designed so they can actually be built. We have seen design-build MEP systems work well in rigorous complex installations like FDA-regulated pharmaceutical facilities and high-tech facilities with hazardous materials concerns. This methodology should be encouraged in healthcare work.

■ **Examine energy efficiency** retrofitting for conversion of existing facilities into medical office buildings. There is a potential for energy savings over the occupancy lifecycle.

■ **Study the functionality of healthcare facilities.** Management will be pressuring designers and planners to study the facilities they have designed to see if they can be made more functional.

■ **Consider utilizing Lean Construction techniques.** Using the last-planner system, value-stream

## Better Planning

■ **Thoroughly complete construction documents to near 100 percent before starting construction.** Hold your designers and consultants to this requirement. Get your designer to meet tight design schedules, have the owner and designers agree to stick with design decisions and follow through on commitments. This will decrease rework and make the final review go smoother.

■ **Consider using Building Information Modeling (BIM)** where appropriate on mechanical, electrical and plumbing (MEP) features and structural elements to detect design clashes and minimize interferences of very expensive systems.

■ **Examine project-specific innovative techniques** or approaches that utilize measurable results and achieve the goals of the client and builder.

■ **Identify practices** that are inefficient and unpro-

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mapping, sharing gain and pain, optimizing the whole, sharing profit and loss and maximizing value and minimizing waste.

- **Project delivery models.** Forty-six percent use traditional design-bid-build versus 30 percent that use guaranteed maximum price and nine percent that use integrated project delivery.

- **Full-scale physical mock-ups** of patient rooms and racks for bidding purposes. Examples include Kaiser's Sidney Garfield Center concept, the Miami Valley Hospital's Dayton Hospital Project employing prefab elements and UCSF "Mock" MRI. These mock-ups also allow end-users to give input and regulatory agencies to grasp the prefab approach.

- **Evidence-Based Design.** Use design to improve hospital functionality. Use evidence to inform design decisions. Use research data rather than expert opinion. Linking statistical evidence on patient outcomes to the physical environment.



*Using full-scale mock-ups of patient rooms and MRI facilities streamlines processes.*

## Better Partnering

- Use a “partnering” type of arrangement and establish incentives to focus the entire team on shared project goals. Establish a communication pact or strategy to flush out challenges or roadblocks and elicit cooperation.

- **Limit change orders** by having a full discussion with the contractor subs and designers about where the risks are and get acknowledgement that the documents are sufficient to build from.

- **Sharing risk of material cost increases** between the owner and subcontractors. Buy critical materials early (i.e. pre-purchasing materials such as structural steel, copper and metal studs). Investigate alternate procurement strategies.

- **Integrated Project Delivery techniques:** Collaborative relationships require constant communication.



*Buying critical materials such as structural steel and copper early can decrease the cost of materials.*

Consider shifting from a single party in control to parties working together in a spirit of cooperation and mutual respect for the benefit of the project.

## Better Energy Use

- **Go green** by examining environmentally friendly construction materials. Fifty-three percent of hospitals in 2010 reportedly evaluated the cost and benefit of green construction. This issue is complicated by leaner budgets. Will long-term performance of systems and materials intended to reduce a facility's carbon footprints pan out? Will major retrofits be required if the systems don't perform as intended? Basic savings and energy efficiency are the bottom line in tough times.

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*Energy-efficient buildings are important in tough times.*

■ **Review better energy choices.**

Healthcare organizations will be using cost engineering models to analyze long-term operational costs to examine energy and carbon reduction scenarios.

■ **Remove non-medical structures** such as food service, gift

shops, outpatient facilities, etc. from acute-care facility construction areas so that these portions of the project aren't subject to OSHPD jurisdiction and time-consuming reviews and regulations.

■ **Multi-trade prefabrication** of bathroom pods, racks and headwalls offsite saves time, cost and energy use.

## Better Compliance and Finance Strategy

■ **Agree not to make any changes** to those portions of the design that have already been reviewed and approved by OSHPD. Avoid, if at all possible, the possibility of a change kicking the project review back into the queue of the traditional

repetitive reviews by OSHPD.

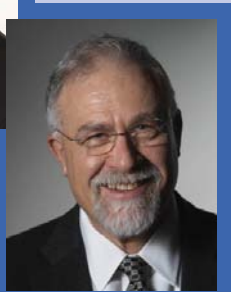
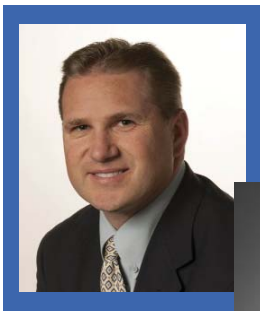
■ **Public-private partnership:** The Healthcare Construction Summits of 2010 connected hospitals and health care systems with the California Labor and Workforce Development Agency, OSHPD, the California Construction Industry and labor representatives. The goal is to increase the number of construction workers, subcontractors and general contractors who can work on OSHPD-compliant healthcare construction contracts in California and leverage healthcare construction to stimulate the California economy overall.

■ **Owner-Controlled Insurance Programs (OCIP):** On large projects exceeding \$100 million, the owner can realize savings by pooling and negotiating more favorable insurance rates than individual contractors (usually a 1 percent to 2 percent savings).

■ **Expansion of the OSHPD expedited plan review** process to accelerate hospital construction projects under \$2 million to under \$5 million.

■ **Phased Plan Review (PPR).** Attempts to reduce and streamline the traditional 12-to-24 month OSHPD plan review process are being developed by Dr. Glenn Ballard at the University of California at Berkeley's Project Production Systems Laboratory.

**Conclusion:** We are all in this together – including the design, engineering and construction community. Everyone needs quality healthcare that's affordable. Building great facilities at reasonable costs benefits us all. Many of the methods and tools described above will help us achieve our goals.



## About the Authors

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