Breakthrough Results in Design, Construction & Delivery of Fast Track $320M Acute-Care Hospital

The Sutter Medical Center Castro Valley project currently under construction is a 231,000 sf, 130 bed, $320 million project. It must meet state-mandated deadlines to be in full compliance with new seismic codes by January 1st, 2013. Therefore, the project must be planned, priced, designed, permitted, built, licensed and open two years faster than any other comparable project in the state. In a very tight capital environment, success of the project depends on 100% certainty of meeting budget without compromising the owner's goal to provide a transformational cellular care and patient-centered facility.

Breakthrough results to date:

1. Due to digital prototyping the project, from a planning point of view, is 3 years ahead of where it would be if traditional approaches were used. Therefore the team has very high certainty of maintaining or beating budget and schedule.
2. Owners risk management contingency was halved due to certainty of process freeing up $1 OM to create actual value for the owner.
3. Delivered 100% complete structural package and received permit in 15 months (24 month acceleration).
4. Saved 18% of the projected pre-construction costs at time the first permit package was submitted.
5. Met all structural steel construction milestones (steel erection started 1 week early).
6. Never exceeded the target budget since Q1 of 2008 when the owner's clinical program was finalized.
7. Met all 19 milestone design package deliverables to the State.
8. Avoided hundreds of potential RFI/construction change order situations during design without cost impact.

The strategies and key process innovations that led to those results are explained below:

1. Industry-First 11 Party Integrated Project Delivery (IPD) Contract: This type of contract differs from traditional contracts where the owner, design, and construction teams are focused on optimizing their parts of the project at the expense of optimization across the entire design and construction value stream. The new contract provides a risk / reward framework that encourages collaboration to identify value and eliminate risk in order to be successful.
2. New Streamlined and Phased Permitting Processes: Traditionally, California healthcare projects are permitted by submitting complete design packages to OSHPD (the permitting agency) then undergo 24 months of review before being permitted for construction. This project is being allowed to go into construction with just its structural package reviewed and permitted. This requires tremendous coordination of the full team to ensure that package does not constrain the later Arch/MEP packages. Those full packages have now been submitted with only very minor tweaking of the original structural permit set.
3. Process Mapping the Design, Permitting, and Construction Processes: The team needed to develop new ways to plan and deliver fully informed and 100% complete early design packages while they continue to develop other parts of the design. They identified key interdependent decision points that allowed the team to pull ahead certain parts of the design and complete those 100% without risking rework when completing downstream processes. The team collaborated with a software vendor to develop a robust visual interface to visualize the various tasks, their durations, and dependencies. This system is being used to not only manage design but also construction and the delivery of materials to the site.
4. Procurement Strategies: To reduce risk, the team not only negotiated and selected additional trade contractors and equipment suppliers early (e.g., Elevators, Steel, Stairs, Precast, etc), it also negotiated and preselected large medical equipment by working directly with the manufacturers to receive early information on their next generation equipment without loosing the ability to get the latest models. Traditionally, large medical equipment is selected late during construction and introduces changes to already completed design information.
5. Model-Based Design Reviews: Traditionally the use of 3D design technologies has been limited to clash checking. On this project, the team adapted innovations from the manufacturing industry and implemented digital prototyping techniques to virtually design, detail, coordinate, fabricate, and test the assembly of the facility system's prior to actual installation. The team to the extent possible implemented processes to maximize the direct flow of information from design to detailing to fabrication to construction without recreating this information.
6. Visual Budget Reporting and Control: In what can be considered an industry first, the team is able to provide frequent cross-discipline budget reporting (bi-weekly) which is informed to a large extent by automatic model quantity takeoffs. The team developed a dashboard-like visual interface for budget reporting that illustrates concisely historical budget information, current budget information, and the forecast to complete. Model-based quantities include for example 88% of drywall, 86% of concrete, 83% of door frames and hardware. Overall 25% of total project budget is currently derived from the model and continues to increase as the design is further detailed.
7. Innovative Use of Distributed File Management to Provide Real-time Access to Project Information: The team deployed an off the shelf document management and control server-based solution that has been used in large distributed multi-office enterprises and tailored its configuration for the first time to support a distributed multicompany team working across the US. The system is proving real-time and controlled access to over 45 Gigabytes of 3D and 2D model information as well as associated documentation to anyone on the project team regardless of their location.