

Collaborative design helps hospitals put people first

■ *Bringing the team together early in the design process can improve building efficiency, reduce construction costs and limit resource consumption.*

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An architect, a mechanical engineer and a hospital facilities director are all sitting around a big conference table (no, this is not one of those jokes like the rabbi, priest and pastor together on a train). They're joined by a civil engineer, structural engineer, LEED-accredited professional and interior designer. Ideas are flying fast and furious about how to design the top floor of a new hospital.



Jonsson

The administrators would like to have their offices on the top floor to take advantage of views of Puget Sound, the Cascades and Olympics. The donors would like to have a healing garden on the roof so the patients and visitors have a relaxing place to reflect. The mechanical engineer suggests putting laboratory spaces on the top floor to shorten the distance from fume hoods to the exterior to save energy.

Scenarios like this are happening throughout the Northwest, as design teams discover the ben-

efits of collaborating as early as possible in the planning process to brainstorm better projects. Collaborative planning is much like an initial design charrette, except that more disciplines are included. Goals often relate to budgets and sustainability: decreasing construction and ongoing operational costs, reducing resource consumption and improving overall building efficiency.

When it comes to collaborative design, hospitals are a very different animal than office buildings. The main focus must always be on the best interests of the people within the building, to create a better work and healing environment, which results in maximum productivity and recovery rate. The difference, then, between collaborative design in commercial and healthcare settings, is one of prioritization. The well-being of patients and staff is always at the top of the list in healthcare — which influences the way that decisions are made.

Tighter parameters

Collaborative design is becoming trendy throughout the building industries in general, because it results in such a superior product. With healthcare, the approach can

be more crucial to the success of the project, because hospitals frequently have fewer building options than commercial structures.

Many hospitals are constructed in dense areas, and must work within a tight real estate footprint. Entry and exit areas may be proscribed by an established street layout. Or the new facility may be connected to existing buildings, limiting possibilities for design. And regardless of their intentions to focus on patient wellness, hospitals always struggle with limited financial resources. Participants in the collaborative design process must therefore be more creative in finding mutually beneficial solutions.

Nurses need daylight

Daylighting provides a good example of how collaborative design can improve the human dimension of healthcare facilities. Positioning a building for maximum daylighting is a common design goal for most sustainable structures, so the building is oriented longitudinally, for maximum exposure on the north/south axis. This conserves resources for cooling, heating and lighting.

For hospitals, the human factor makes daylighting a much more significant consideration. Studies show that patients recover faster when they are exposed to natural sunlight. Similarly, healthcare workers are more productive and

make fewer mistakes when they have access to sunlight during their shift.

Calling all good ideas

Daylighting, then, can be an important contributor to the hospital's healing rates. However, many hospitals in the past have reserved window areas for patient rooms, relegating nursing stations to interior sections of the building.

During collaborative brainstorming sessions, design professionals from diverse disciplines can offer input for maximizing staff exposure to natural light. Participants can discuss innovative solutions — as well as inherent difficulties — during sessions.

A solution that might work well from an architectural standpoint may prove impractical from an engineering point of view, or vice versa. Thin buildings are best for daylighting strategies, but may be impossible because of zoning, slope or neighborhood restrictions. The earlier that these potential snags can be identified, the better.

A creative approach

Participants in collaborative design aim for a broad-brush approach, rather than nailing down details. Qualitative, rather than quantitative, topics are encouraged. The more accepting and nonjudgmental the atmosphere is, the more creative the ideas that surface.

Once overarching concepts are agreed upon — such as maximizing daylighting or natural air circulation in appropriate areas — then experts from each discipline can provide more specific input on how the solution might actually be accomplished.

Through integrated design, team members could discuss new ways to locate nursing stations and

storage areas nearby for quicker patient response times, and generally cut down on the amount of walking that staff members must perform during a typical work day. Or surgery units might be clustered close together, to take advantage of energy-saving strategies for the mechanical systems.

Good for budget and people

A mechanical engineer's input can be especially valuable during healthcare integrated design, because hospital mechanical systems are such energy hogs. According to Florida Power & Light, mechanical systems command between 61 percent and 79 percent of total energy use in hospitals, depending on climate. Incorporating energy efficiencies during integrated design can reduce these costs by as much as 25 percent without adding significant cost to the project.

The good news, however, is that many of the mechanical improvements that reduce a hospital's energy consumption also enhance patient comfort and staff productivity. Fresh air in atriums and waiting rooms lowers energy costs, but also makes occupants happier. Rainwater harvesting could make an interior garden or waterfall more economically feasible, again improving patients' and workers' moods.

Similarly, floor-by-floor programming for mechanical systems allows for a more flexible, people-oriented design. The human needs vary greatly on each hospital floor, depending on whether the space is used for visitors, patient recovery, administration, food preparation, surgery or laboratories. If floor-by-floor programs are established during initial design, major economies can be realized. Simultaneously, it becomes easier to accommodate specific human needs later on, for a better staff and patient experience.

Local pioneers

Hospitals around Puget Sound are providing the effectiveness of collaborative design. A major medical center in the Puget Sound area used integrated design to determine whether its new tower would be shaped as a U, C, L, Z or traditional box. Mechanical engineers used energy modeling techniques to verify that a C shape would reduce energy consumption by as much as 2 percent. Since the tower will be attached to an existing structure, collaborative design helped ensure that multiple factors such as glazing and cladding costs, programming space requirements and energy use were considered when the final building shape was established.

At Good Samaritan Hospital in Puyallup, a collaborative design group relied on building information modeling, or BIM, to design both architectural and mechanical features while in early planning stages. The building model helped the project team understand complex three-dimensional issues. The benefit to the mechanical engineer was a clearer understanding of the proposed building early in the project. The mechanical engineer was then able to model the major mechanical systems and their space requirements, so they could be understood by the owner, the design team and the contractor.

The interactive nature of the process allowed collaboration that led to improvements in Good Samaritan's proposed building and mechanical systems.

Given the enormous benefits of collaborative design for healthcare projects, it's inevitable that more local hospitals will follow these examples — and we'll see more conference rooms filled with representatives from virtually all disciplines affected by early design decisions.

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