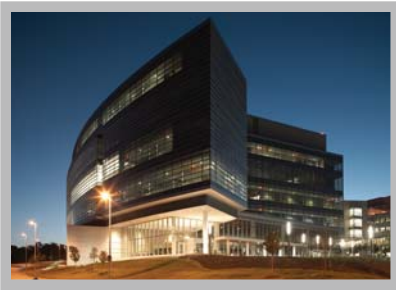


valueengineering



VALUE ENGINEERING CASE STUDY

Froedtert & The Medical College of Wisconsin Clinical Cancer Center Milwaukee, Wisconsin

The 508,000 square foot new Clinical Cancer Center is a five-story structure wrapped in glass that offers 340,000 square feet dedicated to cancer services with space to accommodate projected growth through 2012. The facility offers clinical care for all types of cancer through 13 disease-specific, multi-disciplinary cancer programs and includes three new linear accelerator vaults; support services such as laboratory, imaging, dietary, psycho-social and pastoral care; and space for research facilities and international cancer data registries. Its "hub" design concept is meant to bring all facets of care to the patient rather than requiring the patient to navigate a complex treatment system. The building also contains a 168,000 square foot, 3-story, partially underground, 340-stall parking structure.

Challenges and Solutions

Challenge: To achieve the sleek glass facade, the building was constructed with cantilevered slabs rather than exterior perimeter columns for support. Due to the movement of this slab construction, the window system needed to incorporate slab deflection with the structure, but not leak.

Solution: The design and construction team thoroughly tested and researched the curtain wall system, and prior to onsite construction, built and tested mock-up panels in order to ensure the success of this system.

Challenge: The demolition of the existing parking structure and construction of the new post-tension concrete facility created potential structural issues.

Solution: In order to connect the concrete parking structure to the steel structure of the main building, a transition area was needed. As a result, the building has a transfer level (one that visitors don't see) where the infrastructure supports the necessary transitions between steel and concrete.

Challenge: Installation of the three highly sensitive state-of-the-art linear accelerators necessitated significant concrete and steel coordination.

Project Type:

Healthcare Facility

Delivery Method:

Construction Manager at Risk

Key Participants:**Construction Manager:**

Mortenson Construction

Architect:

OWP/P

Engineers:

OWP/P Project Engineers

Structural:

Harwood Engineering Consultants

Civil:

Graef, Anhalt, Schloemer
& Associates, Inc.

Solution: Coordination meeting after meeting was held with all key stakeholders – the result being eight caissons (100-feet long by 5-feet in diameter) were cast into bedrock and constructed as an addition to the building. Four vertical concrete walls support these three rooms with the walls, floors, and ceilings all constructed of approximately 4-foot thick concrete. A 6-inch steel plate was embedded in the concrete to shield harmful radiation. In total, this portion of the project includes 2,200 yards of concrete (including the foundation); 130 tons of steel plate shielding (encased in the vault walls and floor slab); and 150 tons of concrete reinforcing steel. Not including the support walls, the weight of the three vault's concrete totals 7 million pounds.

Challenge: In keeping with the project (and medical complex's) mantra of "logical, not lavish", the design and construction teams chose to incorporate as many sustainable features, products, materials and methods as possible without incurring additional project costs.

Solution: While the team did not pursue LEED® Certification, it did use LEED® guidelines as a basis for comparison. Some of the sustainable features include: carpet made with a high recycled content; low volatile organic compounds in paint, adhesives and coatings; materials from local manufacturers; and lighting products and systems that optimize energy and minimize pollution. During the construction process, workers were responsible for limiting waste and whenever possible recycling unused materials. They separated building materials such as aluminum, cardboard, glass, plastic, drywall, wood and concrete – with more than 98 percent of the unused and waste-building materials from the project being recycled.

Results:

- Because of its recycling efforts, the project received the "Big Diverter" award from WasteCap.
- Because of design decisions (mechanical features and climates zones) the team exceeded American Society of Heating, Refrigerating and Air-Conditioning Engineers' (ASHRAE) energy conservation standards by 3.5 percent.
- The design of the building was essential to the success of the owner's "hub" philosophy, and the facility has brought a new level of highly specialized patient-focused care to the region.
- The project was completed on time and on budget.