

Making Platinum Out of Steel

BY NINA KRISTEVA, P.E.

Achieving a top LEED rating was only one of the goals in this project to reclaim a desolate industrial site.



City of Tacoma

▲ Value engineering efforts resulted in the use of steel framing system, lightening the structure and speeding construction.



Perkins+Will

▲ The new structure brings functionality and beauty to an area close to town that had been simply an industrial landscape.



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THE SKYLINE ON THE EAST SIDE of the Tacoma (Wash.) Foss Waterway has had an extreme makeover. Instead of petroleum tanks and bare ground, now there is a beautiful steel structure visible from downtown Tacoma—the Center for Urban Waters. The building started taking shape when steel erection began in August 2009. More than 510 pieces of steel were erected in just seven days. The placement of the last piece of steel was celebrated with a small topping out ceremony and the traditional tree was placed on the top of the building. Given the “green” nature of the building, a live tree was used and then planted off-site.

The Center for Urban Waters is an approximately 51,205 sq.-ft three-story office and laboratory building including a public esplanade, a pier, and a floating dock. Urban Waters has been among the highest priorities for Tacoma City Council over the past few years. The structure houses the city's Environmen-

tal Services Department, researchers from the University of Washington-Tacoma, and staff from the Puget Sound Partnership, a new state agency charged with restoring the health of Puget Sound.

The project posed challenges, as city officials wanted it to be a cutting-edge “green” building achieving LEED Platinum certification, which is the USGBC’s highest rating for sustainable and environmentally friendly structures, while staying within its price tag. The maximum budget of \$40 million approved by the council in December 2007 had swelled to \$50 million by late March 2008. City staff and project partners went to work scaling back the design through an extensive value engineering process. More than 80 design features were considered for changes.

“One of the major value engineering goals was to lighten the building in order to reduce the cost of the pile foundations,” said Devin Kleiner, project designer and construction administration architect with Perkins+Will. “That was when steel framing was selected to replace the original concrete design.”

The final structural design incorporated the use of steel framed construction with composite steel wide-flange beams with concrete topped metal deck floor slabs. Special concentrically braced steel frames are used to resist lateral forces from wind and seismic loads.

“This resulted in significant cost savings not only through reduced structure costs but also through a shortened construction schedule,” said Ken Leland, AHBL project structural engineer. AHBL worked in Revit as its building information modeling (BIM) platform to facilitate structural framing analysis iterations. It also was used to coordinate the structural framing system requirements with the architect for conflict resolution and the electronic data transfer with the steel fabricator for detailing and fabrication of the structural steel elements, which contributed significantly to the reduced schedule.

“Steel went up in seven days,” said Kleiner, “with no hitches.”

The natural ventilation and architectural design features in many areas are facilitated by architecturally exposed steel structure. “A major goal was to expose systems and provide a humble transparent environment,” Kleiner said. “Exposing the structural frame was part of this process.”

Replacing the concrete framing system with steel as a result of the value engineering process allowed the critical programming needs to be met while maintaining the goal of attaining LEED Platinum certification and bringing the project back within the construction budget.

MSC

Owner/Developer

LORIG Real Estate Development & Management Services, Seattle

Architect

Perkins+Will, Seattle

Structural Engineer

AHBL, Inc. Tacoma, Wash. (AISC Member)

Steel Fabricator

Precision Iron Works, Pacific, Wash. (AISC Member)

Steel Erector

Evergreen Erectors, Lynnwood, Wash. (IMPACT Member)

General Contractor

Turner Construction Company, Seattle