

Early to the Party

BY MARTIN ANDERSON



Using a kit-of-parts approach, the Golden Gate Bridge's welcome center comes together in time for a big birthday bash.

THE GOLDEN GATE BRIDGE is one of the most instantly recognizable bridges in the world—perhaps *the* most.

And it just turned 75.

On May 27 the Golden Gate Bridge celebrated three-quarters of a century of service to both the thousands of Bay Area commuters who cross and the thousands of tourists who visit it daily. Arriving just in time to help handle the anniversary crowds was a new steel-framed bridge pavilion building at the San Francisco end of the bridge.

Approximately nine million people visit the bridge each year—around twenty-four thousand a day—putting a significant strain on the local facilities. As the 75th anniversary approached, it became clear that the existing visitor facilities would need to be updated and reorganized to handle the

ever-increasing flow of people and traffic. A number of site upgrades were needed: changing traffic flows for buses, new parking arrangements, renovating the historic Round House facility into an education center and creating an entirely new 3,500-sq.-ft bridge pavilion building to serve as the updated welcome center and museum store.

The request for proposal for the new pavilion was issued in January 2011, with an aggressive project deadline; it would have to pass review by three agencies, as well as successfully complete a Cultural Landscape Report for the California State Historic Preservation Office and still be open and operational by April 2012. Moreover, the entire project would have to minimize the impact to existing traffic and visitor flows. Some disruption would be inevitable, but even so thousands upon thou-



photos this spread by Mariko Reed

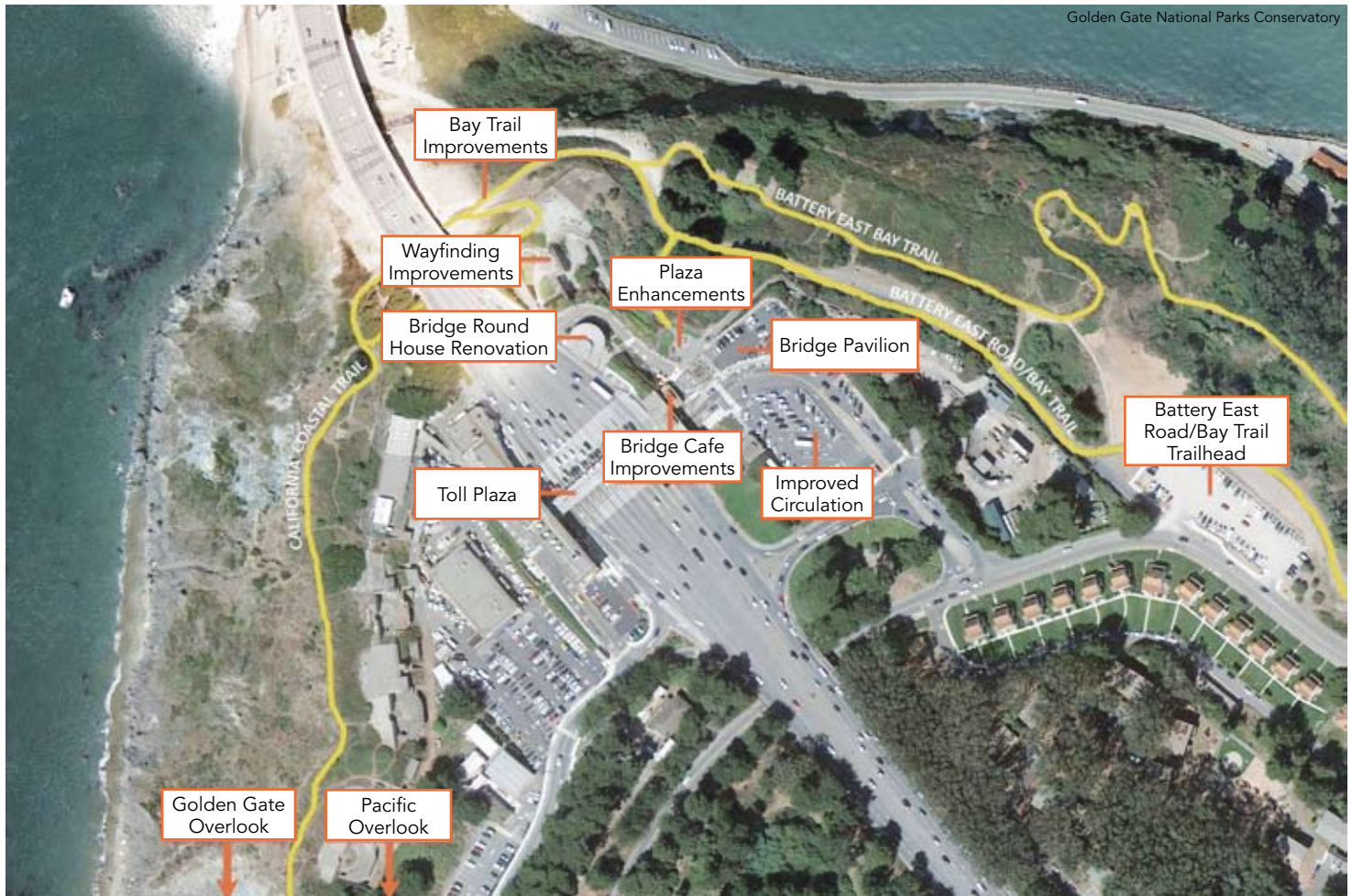
sands of people would be passing through the area on a daily basis. Combined with a restricted site butting up against two 2:1 slopes and a 6-ft drop across the building's 100-ft length, it was going to be a challenging project.

Modular Method

To execute these improvements, the Golden Gate National Parks Conservancy (an arm of the National Park Service) partnered with the Golden Gate Bridge Highway and Transportation District, which was created in 1928 to build and operate the Bridge. The task of building the new bridge pavilion was given to Project Frog, a company that has the self-proclaimed goal of revolutionizing the way buildings are created.

Martin Anderson is AISC's Steel Solutions Center information specialist. He can be reached at anderson@aisc.org.





▲ The new Bridge Pavilion is one of several site improvements being made at the Golden Gate.

Founded in 2006 with an initial focus on the school market, Project Frog takes a systematic approach to buildings to produce customized structures from carefully standardized components. The company's individual buildings (which are generally single-story) are basically assemblies of options that are fabricated off-site, shipped flat and assembled/erected on-site. This involves a careful balance between taking advantage of prefabrication without shipping unnecessary volumes of empty space, unduly complicating crane lifts, requiring too many truckloads or demanding special hauling.

This approach isn't prefab for the sake of prefab, nor is it traditional modular construction, but is rather more akin to a "kit of parts" that is specifically designed for speed, ease of construction, environmental performance and finished quality. Individual building components (such as wall panels, roof panels, window systems, internal structural supports and so on) are designed from the outset to work with the rest of the system so that they can be combined in many different ways. This lets each building be customized to meet project-specific requirements without sacrificing the speed afforded by component standardization.

Among the advantages of this approach is the ability to rapidly develop shop drawings, since individual parts of the system have their own independent drawings developed in advance. When the building design is finalized, components

are picked from the catalog as needed, with their drawings already complete.

In the case of the bridge pavilion, the kit-of-parts approach made it possible to meet the aggressive project schedule; it took less than two months to go from site selection and program development to final design and construction documents. In fact, since the curtain wall and entrance systems had the longest production lead times, shop drawings for those components were approved and released for manufacturing before the final floor elevation was determined.

Similarly, the entire building shell was able to be installed by a four-person crew—three ironworkers and one small crane operator. The structural steel was designed so that all welds were performed in the shop and all field connections were bolted. Insulated metal stud wall panels (painted in International Orange to match the bridge, of course!) were dropped into place by crane, with full adjustability provided by slotted Halfen anchors at the base and a proprietary Unistrut detail at the top.

A Worthwhile Process

The structural steel fabrication and erection were both handled by Ahlborn Structural Steel, Inc., who has provided steel work for several Project Frog buildings and has found the modular process worthwhile.

“One of the most desirable aspects of the structural steel prefab building concept is the option to fill holes in our shop schedule,” says Ahlborn’s president, Tom Ahlborn. “If we have an opening, we will check with Project Frog on progress on a particular job in their pipeline. On many occasions we have released assemblies for fabrication, trusses, braced frames and the like ahead of the actual job release. These are assemblies we know will not change from job to job, so our only worry is how long they may sit before shipping to paint.”

“Further, estimating for these types of buildings is easy since we put in the time up front,” he continues. “No two jobs are the same, but we have a master list of assemblies we’ve priced out with individual weights for HSS, wide-flange and plates, including fit-up requirements, welds, machining and QA/QC times for each.”

Ahlborn explains that when Project Frog sends his shop a building package, a complete price is available within a matter of minutes, including a detailed breakdown of the shop hours required. With each package, the shop typically sees a few new assemblies, which are added to its database.

All of this gives the customer their building faster and lets the fabricator run their shop for maximum efficiency. The focus on speed and efficiency extends to BIM, says Ahlborn detailing manager Deric Henderson.

“All Project Frog modular buildings are created and designed in 3D,” he explains. “When the project is handed off to us, we

import their model into Tekla for checking, troubleshooting and general review. We then send Project Frog an export of our model for them to review, allowing our teams to find and resolve issues long before they become problems. Project Frog and the Ahlborn detailing team work in unison during these projects—not just during production, but also during building creation and design.”

The structure opened on May 8 in plenty of time to host the thousands of visitors who came to celebrate the Golden Gate Bridge’s 75th birthday on May 27. MSC

Owner

Golden Gate National Parks Conservancy

Architect

Jensen Architects, San Francisco

Building Kit Designer

Project Frog, San Francisco

Structural Engineer

Tipping Mar, Berkeley, Calif.

General Contractor

Fisher Development, Inc.

Steel Team

Fabricator, Erector and Detailer

Ahlborn Structural Steel, Inc., Santa Rosa, Calif. (AISC Member/AISC Certified Fabricator)