



National Park Service
U.S. Department of Interior

NPS Cosco Busan Recreational Use Program

Waterfront Railings at Fort Mason Center: Final Programmatic Report

June, 2019

Recipient Park Unit: Golden Gate National Recreation Area
Project Location: Lower Fort Mason, San Francisco, CA
Date Approved: January 8, 2013
Project Period: March 2013 – February 2016
Award Amount: \$344,000
Funding Allocations: FY2013 \$180,000
FY2015 \$164,000
Total Expended: \$343,997
Matching Contribution: \$127,000
Fund Source: Fort Mason Center for Arts and Culture
Project Number: PHP0202335

1. Summary of Accomplishments

This project funded design, fabrication, and delivery of 2,220 linear feet of code-compliant, modular stainless steel pipe and cable guardrail that replaced the 35-year-old, obsolete, damaged, and unsightly temporary fencing and barricades throughout the waterfront at Lower Fort Mason. This project was completed in partnership with the Fort Mason Center for Arts and Culture (FMC), a nonprofit partner of Golden Gate National Recreation Area (GGNRA). FMC operates and maintains its Lower Fort Mason historic campus through a 50-year lease agreement with the National Park Service (NPS). A portion of the FMC footprint includes the sheds and public pier aprons of Pier 2 and Pier 3, as well as a small length of public shoreline. FMC provided funding and construction management for demolition of the existing railings, and installation of the new waterfront railings.

2. Project Activities & Outcomes

The original 2013 proposal for this project, as approved by the Cosco Busan Trustee Council, was intended to provide funding to replace the waterfront railings on Piers 2

and 3, and resurface the asphalt pier aprons, in collaboration with FMC at their Lower Fort Mason campus. The project timeline overlapped with the FMC's \$21 million rehabilitation of the Pier 2 shed to establish a Fort Mason campus of the San Francisco Art Institute (SFAI). However, The SFAI project ending up completing the apron renovation and repaving on Pier 2, as well as slurry coating the Pier 3 apron with other funds before the NPS Cosco-Busan funded project was initiated. In addition, the cost estimates provided by FMC for the originally-proposed project significantly underestimated the actual costs. In light of these factors, the NPS requested a modification to the project in 2015, reducing the scope of the portion paid for by Cosco Busan funds to the design, fabrication and delivery of a modular metal guardrail system for the marine piers; FMC agreed to fund and manage the demolition of the existing railing, as well as the installation and long-term maintenance of the new pier guardrail system.

Lower Fort Mason is part of the San Francisco Port of Embarkation National Historic Landmark (NHL). The NHL district consists of the Headquarters Building (FM201) at upper Fort Mason, and the port area of Lower Fort Mason (including Building A, Storehouses B-E, Piers 1-3 and Pier Sheds 1-3). From 1910 to 1963, the Lower Fort Mason area served as the point of embarkation for American military personnel to the Pacific during both wartime and peacetime. The shed on Pier 2 currently houses the Herbst Pavilion and SFAI campus, while the shed on Pier 3 is now utilized as the Festival Pavilion for large public events.

In order to adhere to recommendations in cultural resource reports and NHL guidelines, any efforts to renovate, repair, or alter the site include requirements to conserve all historic material, and to maintain the historic character of the place. Lower Fort Mason's connection to the San Francisco Bay is central to its historic character. Although original warehousing and dock activities no longer exist, the hardware of that time, including marine bollards, cleats, and other marine appurtenances, remain and need to be preserved. Site furnishings should be kept consistent with the historic military character, and the design of the waterfront should support all types of existing pedestrian uses, such as walking, sitting, sight-seeing, picnicking and fishing. Historically there were no railings at the site when it functioned as a working pier. However, with the increase in public use over time, simple two-rail galvanized pipe railings were installed in the concrete aprons of the piers and along the seawall between the piers around 1980.

By 2013, the two-rail galvanized pipe railing system was deteriorated and in need of replacement. The National Park Service determined that the new railing system would be a guardrail, and comply with the International Building Code, accessibility codes, and the Secretary of the Interior's *Standards for Rehabilitation* as well as NPS guidelines for historic preservation.

The NPS provided conceptual design drawings for the proposed guardrail system and required that the metal guardrail system be modular in order to address variable lengths; various straight, corner and angular connections; variable installation surfaces;

and incorporate the flexibility to add future guardrails as funds become available.

In order to comply with International Building Code requirements, the guard rails were constructed to be not less than 42 inches high, with no openings that allow the passage of a sphere 4 inches in diameter, and which meet specific linear and concentrated load requirements. To comply with the Architectural Barriers Act/ Americans with Disabilities Act Accessibility Standards (ABAAS), 25% of the railings needed to have a maximum height of 34 inches, dispersed throughout each segment of the railing. The final design incorporated modular stainless steel piping with a cable railing system. All guardrail, fasteners and related hardware were constructed of stainless steel suitable for use in the harsh marine environment. To protect the historic integrity of the waterfront piers, a flange attachment system (rather than embedded sleeves) was utilized. The design also accommodated existing waterfront appurtenances, including marine bollards, historic ladders, cleats, and similar elements.

Seven segments of pier and waterfront length were identified in need of guardrail replacement, including the easternmost waterfront and the east, north and west sides of Piers 2 and 3, totaling 2,895 linear feet of railing. The design, fabrication and delivery were accomplished in two phases. Phase 1 included 750 linear feet of railing for the easternmost waterfront and east side of Pier 3 with design, construction and delivery completed between August 21, 2015 and January 29, 2016. Phase 2 included most of the remaining segments of Pier 3 and Pier 2 with construction and delivery completed between September 21, 2015 and February 5, 2016. Approximately 2,200 linear feet of modular railing was fabricated and delivered utilizing the available funds.

3. Benefits

Approximately 1.4 million people visit Fort Mason Center for Arts and Culture at Lower Fort Mason each year. Activities pursued by local and international visitors on these public piers include recreational fishing and crabbing, walking, cycling, running, and enjoying the views of the Golden Gate Bridge, Angel Island, Alcatraz Island, and the Marin Headlands, as well as commercial and recreational vessels operating in San Francisco Bay. The Herbst and Festival Pavilions on Piers 2 and 3 host large public and private events. The piers and waterfront are also used for public exhibits and art installations, such as the Outdoor Exploratorium. In addition, the waterfront is routinely used for scientific observation and research by many organizations, including the National Oceanic and Atmospheric Administration (NOAA).

The new guardrail system improves waterfront safety for all visitors by complying with International Building Code requirements for guardrails, and ensures accessibility for all through compliance with the Architectural Barriers Act/Americans with Disabilities Act (ABAAS), including ABAAS guidelines for outdoor recreation facilities.

Waterfront access is not the only advantage of the improvements. The new guardrail system dramatically enhances the aesthetics of the site in the context of the historic waterfront setting. The new, consistent railings on the piers and waterfront improve

the historic campus within the NPS guidelines for historic preservation.

4. Lessons Learned

This project encountered several challenges that delayed implementation of the project for approximately a year and a half. These included lack of a dedicated project manager, inaccurate cost estimating, the requirement to meet a range of code and historic preservation requirements, determination of the appropriate contracting method, and coordination with another major construction project. Progress accelerated when a Historical Architect in GGNRA's Cultural Resource division, with extensive construction experience in historic landscapes, was assigned as project lead. He was quickly able to identify code requirements and the appropriate historic preservation standards. He prepared a site plan, railing elevations, typical details, and field splice and expansion joint details for the steel pipe guardrail system that were used as the basis for accurate cost estimating, and as a scope of work for contracting for fabrication and delivery. Another challenge was determining the appropriate contracting mechanism for the project since the NPS was providing materials but the site is managed by a park partner under a long-term lease. It was not possible to enter into any type of agreement that transferred funds directly to FMC to undertake the entire project. In the end, the NPS was able to contract for purchasing of fabrication and delivery of materials, rather than for construction, in order to comply with procurement regulations.

The project delays were actually beneficial in the end, as the construction of the San Francisco Art Institute campus on Pier 2 was completed prior to the installation of the guardrail system. That project made the improvements to the pier aprons, and there were no conflicts between the two projects.

Working with FMC, a long-standing non-profit partner of GGNRA, resulted in a seamless project, where FMC was able to manage installation of the guardrail system as soon as materials were delivered, and complete the project in a timely manner, with immediate benefits to the public.

5. Funding acknowledgement

Funding for this recreational use restoration project was provided, in part, by the Cosco Busan Trustee Council comprised of the California Department of Fish and Wildlife, the California State Lands Commission, the National Oceanic and Atmospheric Administration, and the Department of the Interior through the U.S. Fish and Wildlife Service and the National Park Service. Cosco Busan funds were used to design, fabricate and deliver the new guardrail system.

The Fort Mason Center for Arts and Culture provided funds for demolition of the existing railing and installation and long-term maintenance of the new guardrail system.

In addition to Cosco Busan funding and FMC support, NPS-funded staff in the Cultural

Resource Division, the Project Management Office, and the Contracting Office at GGNRA provided project management and contracting support for this project.

6. Figures – Before and After Project Photos



Figure 1. Google Earth aerial view of Lower Fort Mason showing Piers 1, 2 and 3 from right to left.



Figure 2. Before: failing galvanized pipe railings and temporary barricades at the end of Pier 3, with view of Alcatraz Island.



Figure 3. After: new modular stainless steel pipe and cable guardrail system at the end of Pier 3, with view of Alcatraz Island.



Figure 4. Before: temporary barricades placed where galvanized pipe railings failed on the east side of Pier 3.



Figure 5. After: new modular stainless steel pipe and cable guardrail system along the east side of Pier 3.



Figure 6. Before: temporary barricades and failing galvanized pipe railings on the north side of Pier 3, with the Golden Gate Bridge in the background.



Figure 7. After: new modular stainless steel pipe and cable guardrail system along the north side of Pier 3, with view of Golden Gate Bridge in the background.



Figure 8. Before: Obsolete galvanized pipe railing along the seawall at the east end of Lower Fort Mason, with Pier 4 and Aquatic Park Pier visible in the background.



Figure 9. After: new modular stainless steel pipe and cable guardrail system along the seawall at the east end of Lower Fort Mason, with Pier 4 and Aquatic Park Pier visible in the background.



Figure 10. After: flange attachment system for new stainless steel pipe and cable guardrail system, used to protect the historic integrity of the piers.



Figure 11. After: new guardrail system installed in a manner that protects historic bollards, cleats and other marine appurtenances.



Figure 12. After: The new stainless steel pipe and cable guardrail system along the west side of Pier 2, designed to maintain the historic character of the NHL.



Figure 13. After: The new stainless steel pipe and cable guardrail system along the seawall between Piers 2 and 3, designed to maintain the historic character of the NHL.



Figure 14. After: public bench along the seawall between Piers 2 and 3, with a view of San Francisco Bay through the new guardrail system.



Figure 15. After: waterfront visitor enjoying the view of Alcatraz over the new pipe and cable guardrail system.