



REDONDO BOARDWALK REPAIR PROJECT

The November 2014 severe wind storm event hit at high tide with wind gusts up to 48 mph and seven-foot waves, pummeling the half-mile Redondo Boardwalk into ruin. In the aftermath, the City of Des Moines sorted through the damage, declared a state of emergency, and began a strategy to replace this iconic waterfront feature.

The City first sought funding. FHWA Emergency Relief provided one-third of the project budget, with State, TIB, and City funds completing the funding package. The City engaged Exeltech Consulting, Inc., to manage design, environmental permitting, and construction including the preparation of a compensatory Fish C Mitigation Plan. Tasks included demolishing structural members that support the deck; replacing girders, stringers, brackets, decking, and ADA curb ramps; and providing traffic control.

Exeltech determined a design that was flexible within the many geometry constraints and with aesthetic details to blend within the environmental context. They determined appropriate loading for the existing substructure while ensuring that the superstructure would withstand another large storm or seismic event.

FHWA and WSDOT made this project a reality from project management and delivery standpoints; and extensive stakeholder collaboration ensured project success.

Des Moines residents once again enjoy the boardwalk. Now fully restored with composite and stainless steel hand railing, durable concrete decking, and a rustic appearance that evokes a by-gone era, the boardwalk retains its historic place along the waterfront.

CRITERIA

1. Completion date contained in contract. Any time extensions granted should be addressed in the submittal.

2. Construction schedule, management, and control techniques used. Use of alternative materials, practices of funding that demonstrates a commitment to sustainability.



3. Safety performance including number of lost-time injuries per 1,000 man-hours worked and overall safety program employed during the construction phase.

4. Environmental considerations including special steps taken to preserve and protect the environment, endangered species, etc., during the construction phase.

RESPONSE

DESIGN START DATE: April 2015

CONSTRUCTION COMPLETION: July 29, 2016

The project was on a strict deadline. Excellent construction methods and management ensured that the project opened for public use when promised.

A third of the project funding was provided through FHWA Emergency Relief Fund, with the State, TIB, and City completing the funding package. Exeltech completed an alternatives analysis. Following selection, the project budget increased and required the City to secure more funds. Exeltech completed a rendering which demonstrated the desired outcome that helped secure funding.

Extensive stakeholder collaboration and flexibility ensured project success. FHWA and WSDOT were instrumental in making this project a reality from project management and delivery standpoints. Exeltech assisted the City with stakeholders by providing visual aids, applying its design and funding process experience.

Even though there was flexibility within the design, construction revisions were required. The seawall reinforcement was not in the location shown in the plans and the non-destructive testing failed to uncover the irregularities. The designer developed details that addressed the issue, working closely with the contractor to complete the project within the short construction window.

There were zero hours lost, zero lost-time injuries. Because of the concern for safety working alongside a busy corridor, safety was treated with great respect. All standard protocols were followed with an excellent result.

The boardwalk replacement afforded immediate opportunity to restore the shoreline to its native condition. At some point, boulders were added as a feature to the shoreline. This disturbed highly-endangered spawning areas and further endangered species. As part of the mitigation plan, these boulders were removed which allowed recovery of spawn-able beach area.

The boardwalk connects the community to Puget Sound. Near the boardwalk is the MaST Center Aquarium, making the commitment to maintaining sea life significant.

The boardwalk will have upwards of a 70-year service life, featuring highly durable concrete that will withstand future seismic and storm events. This is optimal for the hundreds of pedestrians that walk the boardwalk daily.

5. Community relations—a summary of the efforts by the agency, consultant and contractor to protect public lives and property, minimize public inconvenience and improve relations.



While providing longevity, another reason to use precast was because of environmental considerations. Formwork on the beach was not allowable, nor in-water work, due to spawning beds at the shore. Precast allowed for higher strengths and the simplicity of dropping elements in place. With no wait time for curing, the construction schedule allowed the City to open for public enjoyment sooner.

The City was instrumental to securing public engagement for this highly-valued stretch of walkway. Stakeholders were very involved and important to success, as stated by Associate Transportation Engineer for the City of Des Moines, Andrew Merges. The City was under pressure to return the boardwalk to service. Users had clear ideas of what they expected. The City led by submitting for FHWA emergency funds to repair the boardwalk, verifying budget requirements, finding State, TIB, and city funds to complete the funding package. Exeltech took on the challenge to meet the budget and manage the schedule from design through construction.

“...Throughout project design and construction, your team has been able to efficiently and effectively navigate sometimes ambiguous constraints while at the same time meeting milestones. For example, as the City continually collaborated with potential stakeholders during design, Exeltech was able to provide clear, concrete, and feasible alternatives based on probability of increased funding. Exeltech not only was able to strategically allocate resources to complete the design given the potential for change, but they also provided the City with decision deadlines in order to limit redesign, environmental permitting, and construction advertisement risk. Finally, Exeltech has again exceeded expectations for construction management and inspection. Seamless communication between the Engineer of Record, construction manager, and field staff ensured collaborative partnerships between the City and Contractor. Project risks were identified and mitigated judiciously to ensure success for all parties involved.” – Andrew Merges, PE Executive MPA, Associate Transportation Engineer for the City of Des Moines

- 6. Unusual accomplishments under adverse conditions, including but not limited to, adverse weather, soil or site conditions, or other occurrences over which there was no control.



At typical high tide, the Redondo Boardwalk experiences overtopping saltwater waves making the use of typical cast in place concrete very difficult. Utilizing precast decking provided the durability of concrete without risk of failure that cast-in-place concrete would suffer. Using this method was widely accepted by stakeholders for whom durability and reliability was important.

Repair of the storm-damaged Redondo Boardwalk included restoring structural support, girders, stringers, and brackets; and replacing decking and ADA curb ramps. Exeltech’s design, flexible within many geometry constraints, included aesthetic details to blend into the environmental context, and ensure the superstructure resiliency.

The decking was constructed of precast concrete that used form liners to depict the boardwalk as timber. This meant that the design had to be flexible to encompass many different scenarios. The boardwalk had 162 different lengths from the seawall to the existing pile. For timber construction, cutting the board to fit would be fairly simple; but for concrete precast, there can be many constructability problems. Exeltech also specified a lithium stain that was used to color the concrete to replicate the color of cedar boards. This type of stain reacts with the concrete and develops a chemical bond and coating as hard as the concrete itself and makes the color unsusceptible to UV exposure.

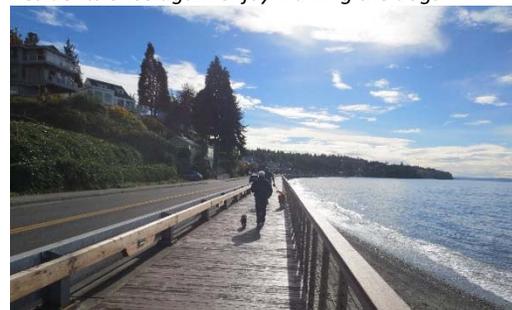
During construction, salvaged boards were reused within the temporary construction barrier. This barrier not only maintained some safety for construction workers, but provided breakwater as the height prevented overtopping of waves onto the roadway.

- 7. Additional considerations you would like to bring to the attention of the project review panel, such as innovations in technology and/or management applications during the project.



Use of precast concrete, formliners, and stain added pattern and color to replicate wood and avoided cast-in-place issues within a tidal surge area. Additionally, this approach allowed for in-the-wet construction. Des Moines residents once again enjoy the boardwalk. Now fully restored with composite decking, durable concrete, and a rustic appearance that evokes a by-gone era, the boardwalk retains its historic place along the waterfront.

Residents once again enjoy walking the dogs





Ribbon cutting with dignitaries, Council and Mayor



Fully completed, facing north

Note: supporting documentation is limited to 20 pages, exclusive of photographs and nomination form. Photographs will be used for promotional purposes by the association. Submittal should include nomination form and supporting documentation form, and photographs. No letters of recommendation please. Simultaneous nomination of the same project in two categories is not permitted.