

ABSTRACT

Since its construction in 1985, visitors have frequented the 1500 ft Potter Marsh Boardwalk paralleling the Seward Highway. The boardwalk serves the Anchorage community as an accessible area to view birds, wildlife, and Alaska's breathtaking scenery year-round. The Alaska Department of Fish and Game (ADF&G) has recognized the need to replace and improve the outdated and failing boardwalk.

The team at Extron analyzed four design alternatives based on ADF&G requests and provided 35% design documents for the selected alternative including boardwalk structures, environmental and hydraulic analyses, and cost estimations.

PROJECT BACKGROUND

The project is located 10 miles South of downtown Anchorage, AK, at the Potter Marsh Wildlife Viewing Boardwalk area.



Figure 1: Project Location

EXISTING CONDITIONS

- Frost Heaved Piles
- Dilapidated Boardwalk
- Outdated Handrail Design
- Linear Alignment
- Noise due to proximity to the highway

DESIGN CONSIDERATIONS

1. **Experience:** Consider off-shoots, viewing platforms and tower, noise reduction, and align with the American Disability Act Standards.
2. **Environmental & Water Impact:** Preserve the core area of the marsh's wildlife habitat.
3. **Cost:** Consider the benefits of the boardwalk given the estimated cost.
4. **Time of Construction/ Phasing:** Allow construction that minimally interferes with wildlife patterns and visitor experience.



Potter Marsh Boardwalk Replacement Project



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This project was prepared by Extron LLC for the Alaska Department of Fish and Game.

THE EXTRON TEAM

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SELECTED DESIGN ALTERNATIVE AND PHASING

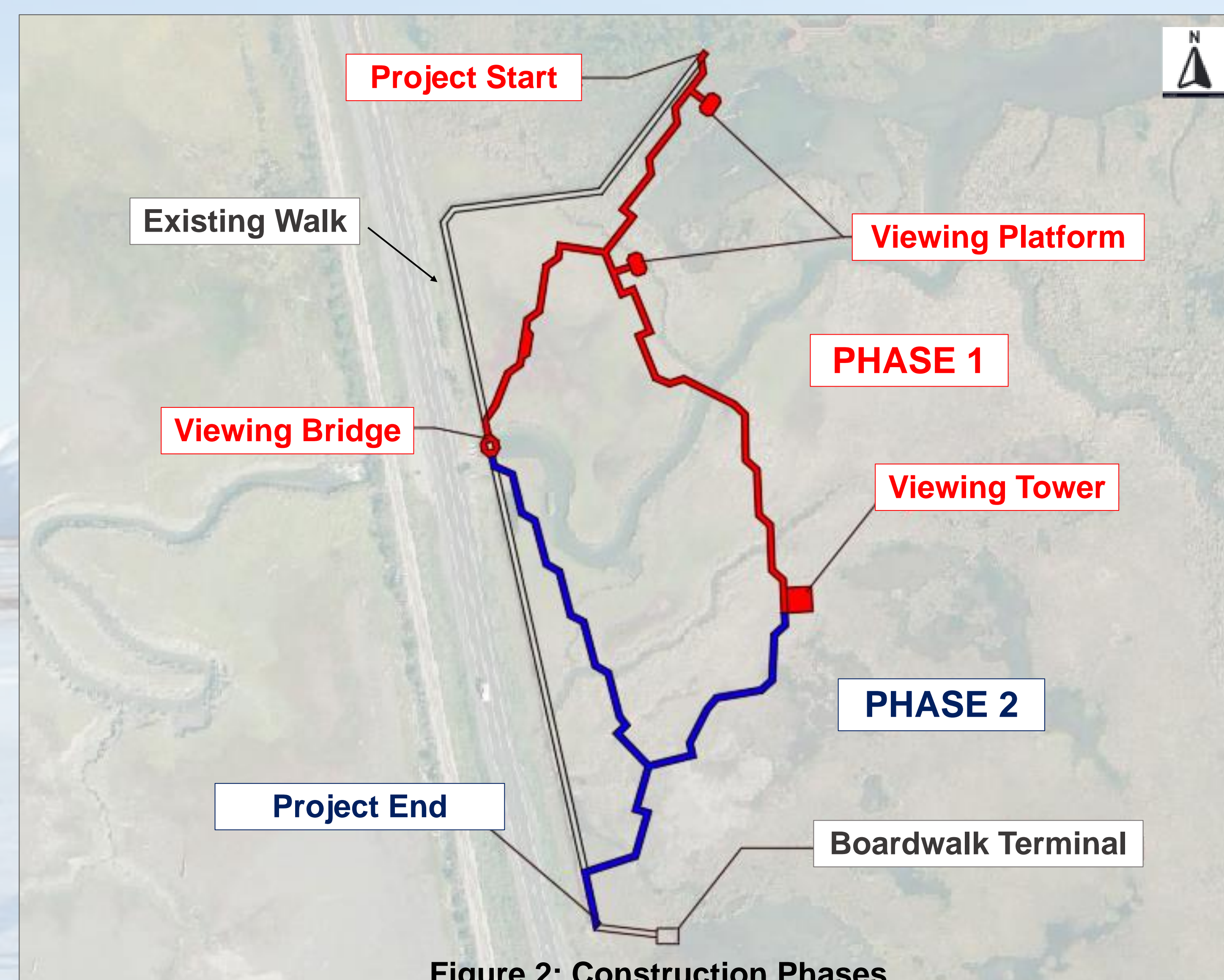
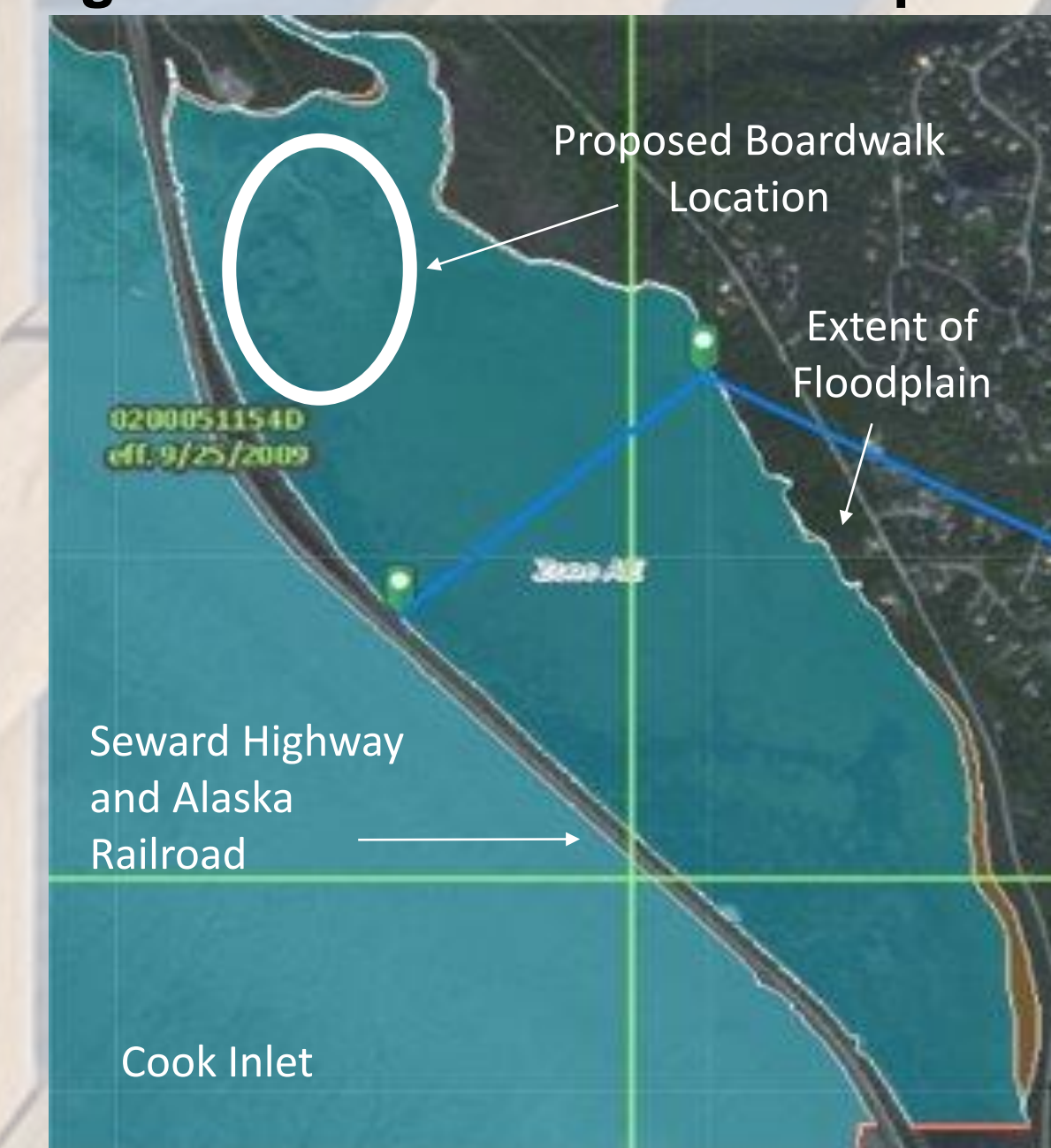


Figure 2: Construction Phases

The selected alternative has two phases as shown in Figure 2 and completes a meandering boardwalk loop, adding an experiential component and accessing key parts of the marsh like the Rabbit Creek salmon spawning area, salt flats, nesting reeds, and high traffic bird areas.

HYDROLOGIC ANALYSIS AND ENVIRONMENTAL CONSIDERATIONS

Figure 3 : Potter Marsh Floodplain



Hydrologic Analysis: The base flood elevation for Potter Marsh is 16 ft above sea level for the 100-year storm according to FEMA. The selected alternative would increase the floodplain by 0.001 ft, a negligible amount.

Environmental Considerations

- Winter construction will help maintain local flora and fauna
- Boardwalk is routed to avoid frequented feeding and nesting areas

SUPERSTRUCTURES

Boardwalk structures were designed, analyzed and modified using RISA 3D software following the 2018 IBC and applicable steel and timber design codes. Structural analysis accounted for live loads, snow loads, wind loads, seismic loads, and deflection limits.

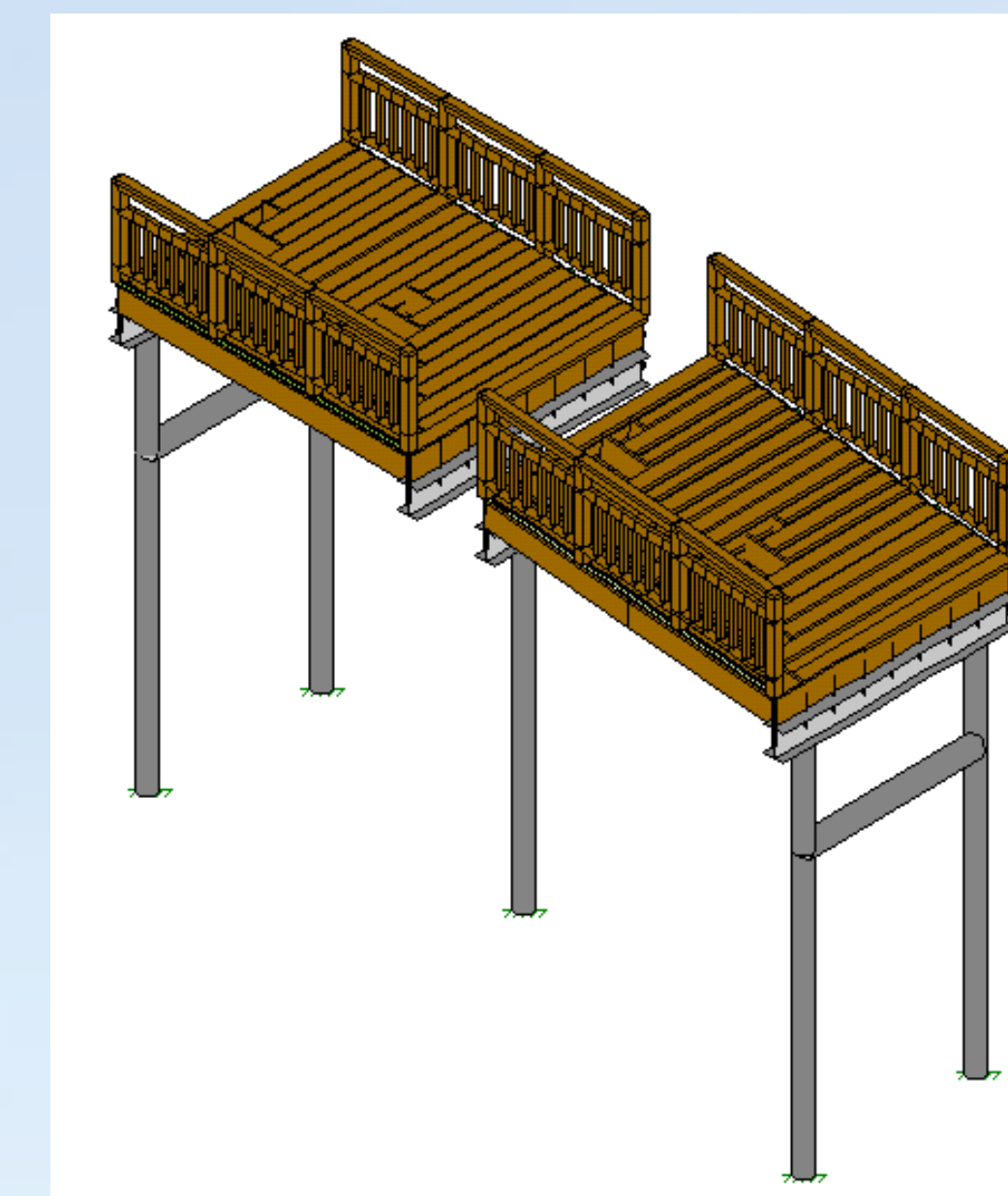


Figure 4: Two 10-ft long, 8-ft wide boardwalk sections.

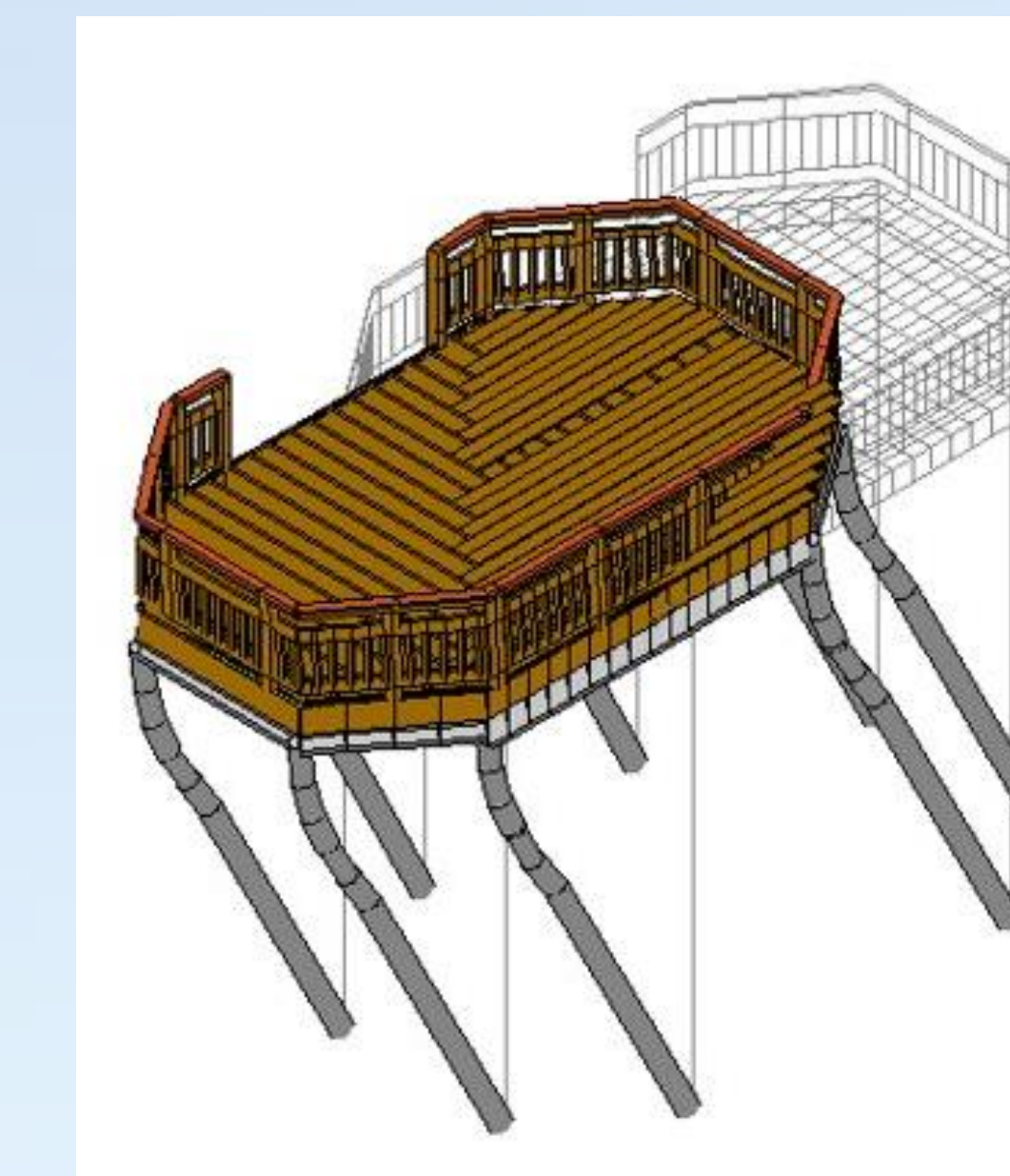


Figure 5: 20-ft by 12-ft wildlife viewing platform; with 10x magnified seismic response.



Figure 6: 25-ft tall viewing tower design module.

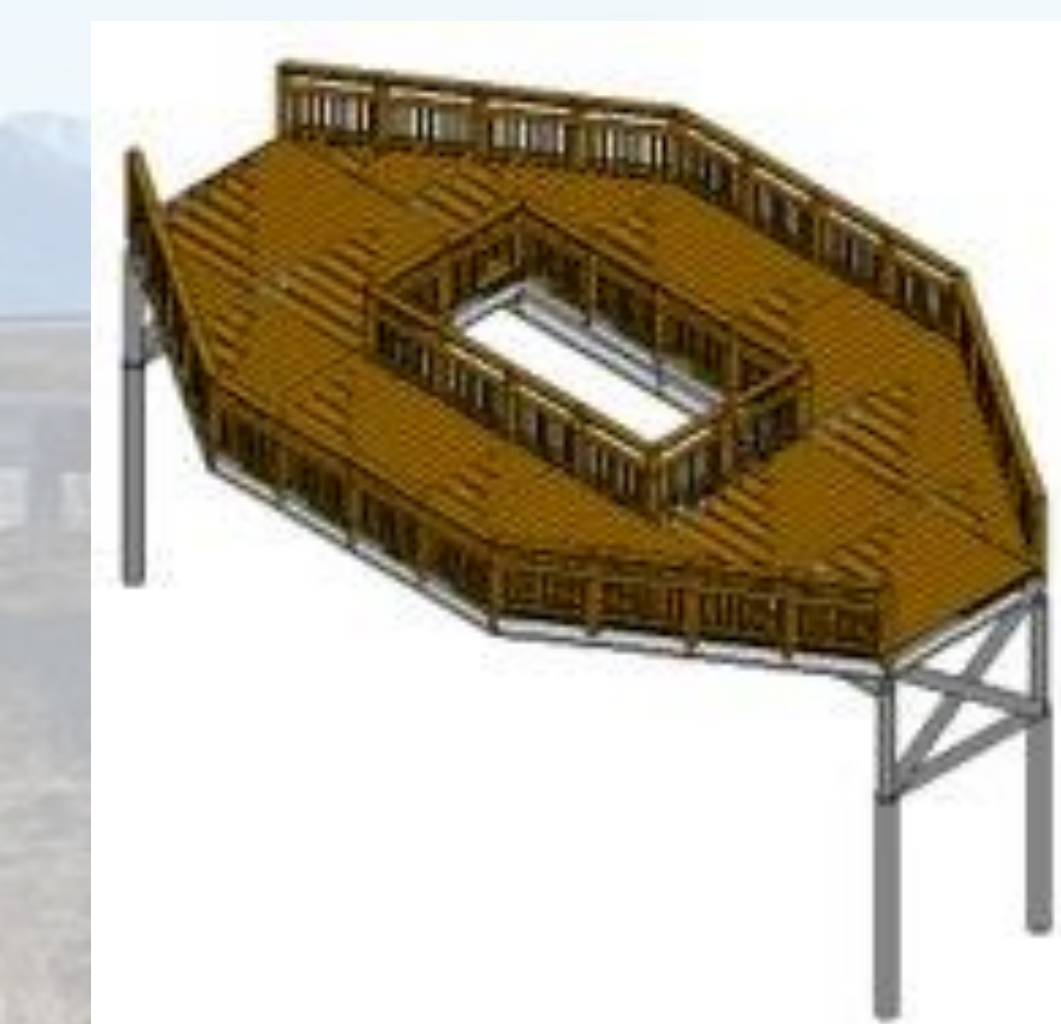
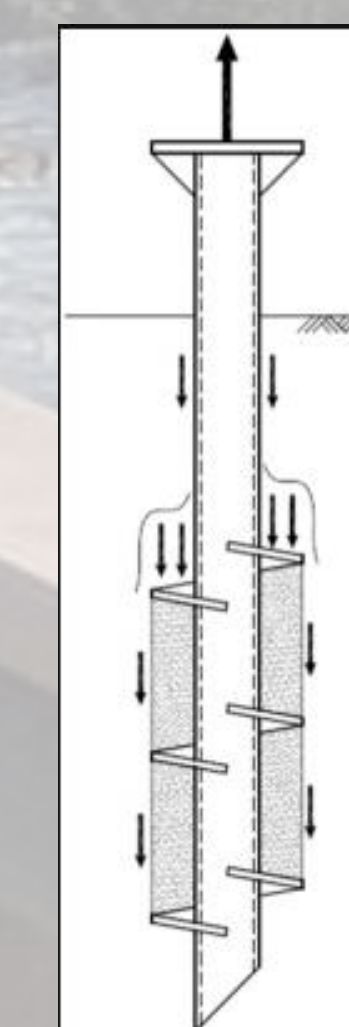


Figure 7: 40-ft long salmon viewing bridge.

FOUNDATION

- 3.5 in. shaft diameter helical piles
- 20+ ft driven depth to mitigate heaving
- Low Impact constructability
- Low cost compared to conventional pile driving methods



COST ESTIMATE

Construction Phase	Cost
Phase 1	\$4.00 million
Phase 2	\$2.81 million
Total	\$6.81 million