



e A S T B A N K

**EXPOSED**

Celebrating the Eastbank Esplanade:  
Portland's New Waterfront Experience

## Eastbank Esplanade Fun Facts

### THE FLOATING WALKWAY

- The white caps on the floating walkway pylons are designed to discourage birds from landing on them. This reduces the problem of bird droppings on the walkway.
- A total of 65 pylons anchor the floating walkway in place and each is embedded 30-feet into the Willamette River bed.
- The floating walkway is 1,200-feet long, 17-feet wide; and is the longest floating walkway in the United States. The floating walkway was conceived due to the lack of available shoreline needed for a continuous path.
- The floating walkway is carefully constructed so that at varying river levels, it is always ADA compliant.
- The poured concrete sections of the floating walkway weigh 800,000 lbs. Sections were constructed in Bellingham, Wash., trucked to the construction site and floated into position.
- The floating walkway is made of concrete and steel rebar. How does it float? The answer dates back to Archimedes' time in 200 B.C. when he said that a body will float if its average density is less than the density of the fluid in which it is floated. The floats are made of concrete shell around foam. They weigh less than the water they displace—thus they stay on top.

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## General Fun Facts

- The Esplanade is fully accessible by bike, on foot or by wheelchair from two bridges: the Steel and the Hawthorne. In between, the Burnside Bridge connector, which is exit only, features the first wheelchair lift in the city.
- Features and segments of the Esplanade were manufactured in a variety of cities and were then delivered to the site. The piece that came the farthest is the Burnside Bridge wheelchair lift which was manufactured in Switzerland.
- Early tree plantings along Phase I and II proved to be tasty meals for local beavers. Mesh wire had to be placed around the plantings to deter the beavers.
- There are 13 “Urban Markers” along the Esplanade designed by Mayer/Reed, landscape architects. They mark the city street grid and give a sense of location when using the Esplanade. Each marker also includes unique lighting to illuminate the walkway at night.
- Mayer/Reed also designed 22 interpretive panels that are attached to urban markers at key locations along the Esplanade. The interpretive panels are educational and deliver information about topics ranging from the building of Portland’s bridges to the development of Portland’s Eastside.
- 280 trees and 43,695 shrubs have been planted along the new Esplanade, mostly native plants of Oregon.

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- The Esplanade is a demonstration project for improved habitat areas for fish and wildlife, and riverbank restoration. In places, the riverbank has been reshaped with grading that will allow for shallow habitat. Bio-engineering techniques use native vegetation and other areas pre-treat I-5 runoff before it enters the river. (All this is a unique feat for a river that seasonally fluctuates 30-feet in water depth.) The plantings also minimize the need for rip-rap rock for erosion control.

Research relating to the bio-engineering and habitat restoration on the Eastbank will be published in scientific journals—especially as the research relates to fish predation.

- The Eastbank Esplanade will eventually connect with the city's Springwater Corridor Trail and 40-mile Loop.
- The construction timeline for the Esplanade, especially work that had to be done in the river, was timed carefully to be sensitive to fish migration seasons.
- Wildlife spotted during construction of the Esplanade and that make this area their home include beavers, ducks, geese, herons, steelhead and salmon.
- To the north of the Morrison Bridge, the Esplanade provides a lookout over what looks like strange rock formations, but which is actually a large accumulation of concrete. The concrete was dumped in this location by cement trucks washing their truck beds in the river during the building of the Morrison Bridge.
- Two pieces of public art sit on a concrete wall that is a remnant wall from Port of Portland terminal 2. The remnant wall is a reminder of early maritime commerce along Portland's Eastside.

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- Several large “root wads” were trucked to the site from Central Oregon. The root wads are anchored in place along the riverbank and will provide important habitat areas for fish.
- The historic nature of the Burnside Bridge prohibits any structure from adding any weight to the bridge. Therefore, the Burnside Bridge connector that connects the Esplanade to the Burnside Bridge does not lean on the bridge, it merely “kisses” the bridge. The connector is held in place by pilings sunk into a huge concrete base at the Esplanade and the tower structure bears the weight of the stair truss.

### The Steel Bridge Fun Facts

Construction of the Steel Bridge was completed in 1912. Authority to construct the bridge was granted to Oregon Railroad and Navigation Company on November 10, 1909, by the Secretary of War. The Steel Bridge is eligible to be on the national historic register of historic structures.

- The Union Pacific Railroad owns the Steel Bridge. The upper deck is leased to ODOT. Tri-Met subleases part of the upper deck from ODOT for MAX operation.
- The Steel Bridge is the only vertical telescoping lift span bridge in operation in the United States. The lower deck structure telescopes, like an antenna, into the upper deck structure.
- When both the upper and lower deck of the Steel Bridge are raised, the total moving load is over nine million pounds.

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- The lower deck of the Steel Bridge is suspended by 56 cables. The bridge is lifted via friction of the metal cables against metal lifting sheaves. To operate properly, the lower deck has to remain in near perfect balance. Balance must be maintained at both the north/south and east/west axis. If balance is not maintained, the bridge will not lift in a level and plumb condition. If the lower deck is not level and plumb, the square lower deck structure will not fit inside the square upper deck structure.

The lower deck must also remain in balance vertically. If the lower deck weight is not balanced with the eight lower deck counterweights, the lifting sheaves will turn, but the bridge will not lift.

- The Steel Bridge is one of the most multi-modally intense bridges in the United States. The upper deck provides daily service to 18,000 vehicles, 500 bicycles, 200 MAX trains, nine bus routes, thousands of pedestrians and the Vintage Trolley. The lower deck provides daily service to over 40 freight and passenger trains.

### The Steel Bridge Walkway Fun Facts

- The Steel Bridge was designed by John Lyle Harrington and J.A.L. Waddell of the Kansas City-based firm of HNTB (Mr. Harrington is the “H” in HNTB.) The firm specializes in transportation, bridges, aviation, architecture, urban design and planning and environmental engineering. The company also has offices in Portland and has been active in the Pacific Northwest for more than 40 years. When it came time to add the new steel bridge walkway, HNTB—the original designers of the bridge—were tapped again as designers of the pedestrian and bicycle crossing portion of the Esplanade project.

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- The Steel Bridge walkway portion of the Eastbank Esplanade is 890 feet long.
- On the south side of the Steel Bridge, a 220 foot long by 8 foot wide walkway was added to the lift span. Total weight of this cantilevered section is 67,028 lbs.

Now imagine a school yard teeter-totter: The cantilevered walkway is the small child on the long side of the teeter-totter. To maintain balance on the short side, a larger quantity of weight is needed. Solution: 96,257 lbs. of railroad rails were added on the north side of the lower deck to keep the “teeter-totter” in balance.

- To make certain the bridge would lift when the 200-horsepower electric motors turn the lifting sheaves, 163,285 lbs. of steel plates were added to the lower deck counterweights.
- To maintain this complex balancing act, every item added to the lift span and lift span counterweights were carefully marked and weighed. For each item added, the distance between its center of gravity and the center of the teeter-totter was calculated. Extensive engineering calculations were required to ensure that the bridge would remain in balance.
- A total of 326,570 lbs. was added to the Steel Bridge for construction of the lift span walkway. All this weight had to be added to the bridge quickly. During a 25-hour period, over 200 lbs. was added to the bridge every minute! The most efficient way to do this was to lock down the lower deck—a feat easier said than done!

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Because the lower deck of the Steel Bridge is the lowest obstruction in the navigable river channel, locking it down essentially closed the river to all but small pleasure craft. To mitigate this impact, extensive coordination with diverse river-users was accomplished. After a year of public meetings and one year's notice, the U.S. Coast Guard issued a permit granting the city permission to lock the lower deck for a time-certain 48 hour period.

The year notice was needed to alert cruise lines that sell river tours up to 18-months in advance. The lock-down did not affect Union Pacific Railroad or Amtrak which were still able to run on schedule.

- The Steel Bridge portion of the Eastbank Esplanade installed 107 trees and 3,286 plants.
- The lift span portion of the Steel Bridge walkway is composed of seven independent panels. The panels are attached to the bridge at each end with custom brackets. Structural limitations prevent drilling new holes in the existing structure. Consequently, each lift span bracket was custom designed to use only the existing rivet holes.
- The lower and upper concrete switchback ramps adjacent to the Steel Bridge that connect up to the eastside overlook area are each longer than a football field.
- Approximately 125 people worked on the project in the field.

