



## CHALLENGE

ORIGINALLY BUILT IN 1936, THE HOMESTEAD GRAYS BRIDGE NEEDED BOTH STRUCTURAL AND AESTHETIC UPGRADES.

## SERVICES

- Civil Engineering
- Environmental Engineering
- Highway Engineering
- Planning
- Structural Engineering

## AWARDS

OUTSTANDING REHABILITATED BRIDGE  
Association for Bridge Construction & Design (ABCD)



DIAMOND AWARD CERTIFICATE  
American Council of Engineering Companies (ACEC) of Pennsylvania

## HOMESTEAD GRAYS BRIDGE

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The Homestead Grays Bridge, also known as the Homestead High Level Bridge, was originally built in 1936 in Pennsylvania.

The bridge spans the Monongahela River between Homestead Borough and the southern tip of Pittsburgh's Squirrel Hill neighborhood. [The Waterfront](#), a 256-acre mixed-use development, is located under the south portion of the bridge.

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## THE WATERFRONT HISTORY

Originally built in 1936, The Waterfront area was a 1225 housing development known as the Ward. A few years later, the United States Steel Company displaced the homes when the U.S. Government ordered the expansion of its steel mill to help support World War II.

a real estate company who began the redevelopment of what is now known as [The Waterfront](#). Today, The Waterfront is an open-air shopping center and home to stores, restaurants, hotels, entertainment, and community events.

The mill closed in 1986 and the site was demolished by 1998. In 2000, the riverfront property was purchased by

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## FIRST BRIDGE USING THE WICHERT TRUSS

One of the unique features of the main bridge is the Wichert trusses, developed by E.M. Wichert of Pittsburgh, Pennsylvania, in 1930.

intermediate piers, the Wichert truss allows each span to be calculated independently.

Before computers, the interaction of forces on spans crossing multiple supports was difficult to calculate. By introducing an open, hinged quadrilateral over the

The Homestead Grays Bridge was the first bridge to use the Wichert truss. Since that time, there have only been a few bridges built in the world using this truss design.

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## REHABILITATING THE HOMESTEAD GRAYS BRIDGE

ms consultants initially started work with the Homestead Grays Bridge in 1988. At that time, the Allegheny County Department of Public Works (ACDPW) hired ms to perform an in-depth inspection of the bridge, prepare a detailed report indicating the condition of the structure, and develop a method of widening the four lanes.

The complete Homestead Grays Bridge project included:

- Widening of the roadway from 40 feet to 46 feet
- Replacement of both sidewalks
- Replacement of the deck and joists in spans 1 to 5
- Construction of a PA barrier (concrete barrier with railing, TL-5A rating)
- Replacement of all expansion dams

- Replacement or retrofitting of all seismically-vulnerable bearings
- Replacement of the through girders in span 5
- Replacement of the floor beams at pier 14
- Construction of ladders and platforms to provide access to the new navigation lighting
- Replacement of the entire drainage system
- Steel and concrete repairs
- Replacement of the overburden at pier 15 with lightweight fill to increase foundation capacity and reconstruction of the roadway approaches

All construction work was performed while maintaining two lanes of traffic on the bridge at all times.