



## Award of Merit

### The Deconstruction of the Old Port Mann Bridge



#### Consultant

McElhanney Consulting Services Ltd.

#### Owner

BC Ministry of Transportation and Infrastructure

#### Client

Kiewit-Flatiron Joint Venture

#### Category

Transportation & Bridges

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In 2012, the Government of British Columbia completed the massive upgrade of Highway 1 east of Vancouver including the construction of the new 10-lane Port Mann Bridge over the Fraser River. As part of this landmark project, the old Port Mann Bridge, which formerly carried the highway, needed to be removed.

Controlled removal of the 586 metre-long, three-span, continuous steel tied-arch bridge was necessary to prevent detrimental impacts to the river environment and, potentially, the adjacent newly constructed bridge. The McElhanney team's removal scheme involved transforming the tied-arch into a cable-stayed system using temporary towers and cables to facilitate cantilevered deconstruction, piece-by-piece. The safe dismantling of this precariously balanced "house of cards" cantilever presented a greater technical challenge than engineering a new cable-stayed bridge, according to the principal engineer.

Not merely a reversal of the original erection scheme, changes over the past 50 years, including an expanded rail yard over the south side-span, added significant complexities. Stresses accumulated in the bridge made the first cut of the arch one of the most "stressful" operations in the project, requiring rigorous planning and precise execution. A high degree of control was desired by the contractor to swiftly adjust the structural behavior through easy maneuvering of cable forces. The team's design empowered the ironworkers to precisely puppeteer the piece-by-piece removal from their so-called "crowsnests" strategically placed on the tower tops.

Deconstruction of the bridge started in December 2012 and the last pieces of steel were taken away for recycling in fall of 2015.