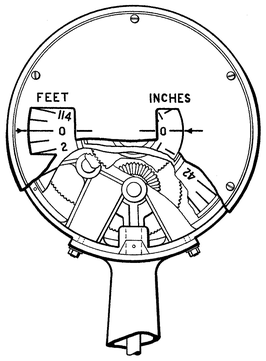
CITY WATERWAY BRIDGE

TACOMA · 1911 · WASHINGTON



Detail

Lift Span Elevation Gague

No Scale

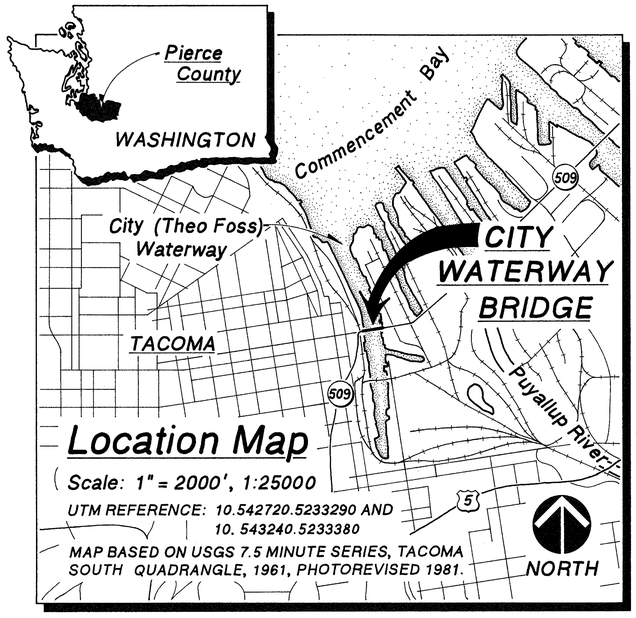
The City Waterway Bridge was built by the City of Tacoma in 1911-13. It was designed to connect two districts: one industrial and the other commercial, which were separated by a navigable channel - The City Waterway. This function was formerly served by a 250-foot swing span bridge built 19 years earlier in the same location. However, continued expansion of the industrial tide flats district in the years after its completion, and the increase in the size and volume of shipping following the construction of the City Waterway in 1902-5 soon rendered it obsolete. The City Waterway Bridge, by contrast, was equipped to withstand the demanding traffic requirements of what was a new era of commerce and industry.

When it was built, the City Waterway Bridge claimed the distinction of being unique among vertical lift bridges for three reasons: the unusually great height of the deck above water when raised; the employment of an overhead span between the towers designed for carrying a water pipe, and the fact it was built on a grade. At a cost of $600,000, it was tremendously significant to the City of Tacoma, constituting the most important municipal project during the year of its completion.

The bridge consists of a 220-foot steel vertical lift span flanking by two steel 190-foot fixed spans and two approach spans, giving a total length of 3200 feet. During construction, to maintain traffic, temporary trestles were built out from either bank to connect with the existing swing bridge. The pier of this bridge was also used as a platform to erect part of the lift span of the new bridge. The lift span is suspended at its four corners by steel ropes which pass over cast-steel sheaves positioned at the tops of the adjacent towers and connect to two concrete counterweights, each weighing 400 tons.

The span is raised or lowered by the action of four drums fixed to the lift span that wind up an arrangement of steel pulley ropes connected to the top and bottom of the tower. The drums are rotated by two 75 h.p. motors which work through a set of gears. A capstan enabled the span to be operated manually if required.

The bridge was designed by the renowned firm of Waddell and Harrington, formed in 1907. J.A.L. Waddell designed one of the first lift bridges, the Halstead Street Lift Bridge, which was built over the Chicago River, Chicago; in 1894. The City Waterway Bridge shares many design features with it, but the operation of the lift represented one of several technological advances. This was loosely based on a patent Waddell and Harrington filed in 1908, and reflects the mechanical engineering skill J.L. Harrington brought to the partnership. Waddell and Harrington disbanded in 1914.



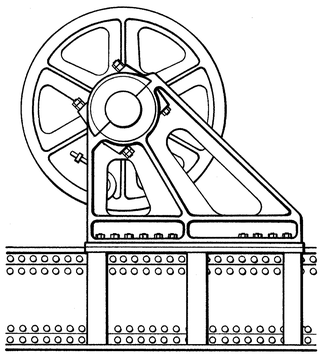
Location Map

Scale: 1" = 2000', 1:25000

UTM REFERENCE: 10.542720.5233290 AND 10. 543240.5233380

MAP BASED ON USGS 7.5 MINUTE SERIES, TACOMA SOUTH QUADRANGLE, 1961, PHOTOREVISED 1981.

This recording project is part of the Historic American Engineering Record (HAER), a long-range program to document historically significant engineering and industrial works in the United States. The HAER program is administered by the Historic American Buildings Survey/Historic American Engineering Record Division (HABS/HAER) of the National Park Service, U.S. Department of the Interior. The Washington State Bridges Recording Project was cosponsored during the summer of 1993 by HABS/HAER under the general direction of Dr. Robert J. Kapsch, Chief, and by the Washington State Department of Transportation (WSDOT), Bernie L. Chaplin, Environmental Program Manager.

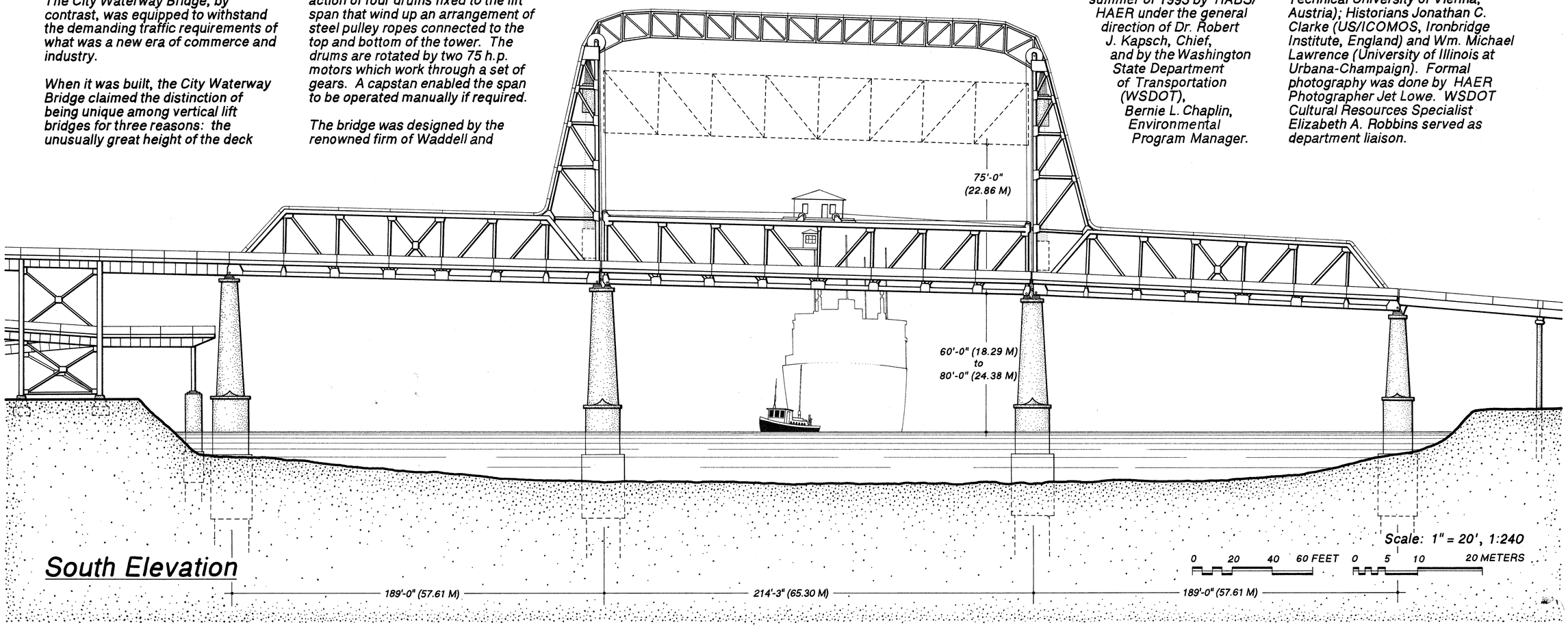


Detail

Drum at Center Lift Span

Scale: 1" = 1'-0", 1:12

The field work, measured drawings, historical reports, and photographs were prepared under the direction of Project Leader Eric N. DeLony, Chief of HAER and HAER Historian Dean A. Herrin, Ph.D. The recording team consisted of Supervisory Architect Karl W. Stumpf (University of Illinois at Urbana-Champaign); Supervisory Historian Robert W. Hadlow, Ph.D. (Washington State University); Architects Vivian Chi (University of Maryland), Erin M. Doherty (Miami University), Catherine I. Kudlik (The Catholic University of America) and Wolfgang G. Mayr (US/ICOMOS, Technical University of Vienna, Austria); Historians Jonathan C. Clarke (US/ICOMOS, Ironbridge Institute, England) and Wm. Michael Lawrence (University of Illinois at Urbana-Champaign). Formal photography was done by HAER Photographer Jet Lowe. WSDOT Cultural Resources Specialist Elizabeth A. Robbins served as department liaison.



South Elevation

Scale: 1" = 20', 1:240

0 20 40 60 FEET 0 5 10 20 METERS

HISTORIC AMERICAN ENGINEERING RECORD WA-100

SHEET 1 OF 2 SHEETS

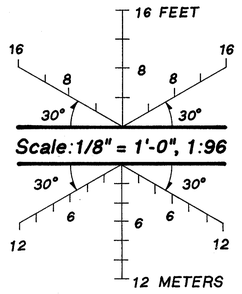
WASHINGTON

CITY WATERWAY (11TH STREET) BRIDGE - 1911
CITY (THEO FOSS) WATERWAY
STATE ROUTE 509 SPANNING
PIERCE COUNTY

WASHINGTON STATE BRIDGES RECORDING PROJECT
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

TACOMA

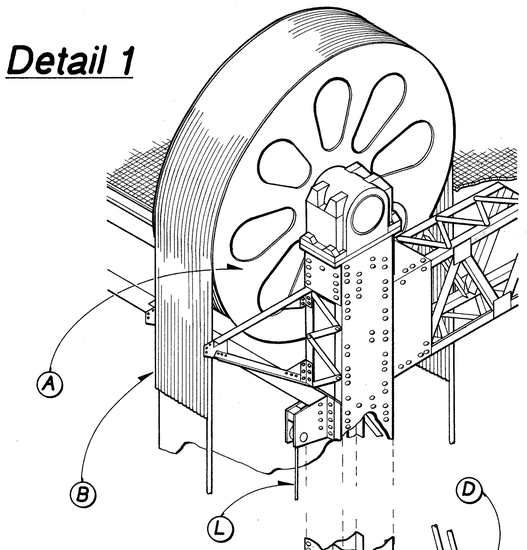
DRAWN BY: *Wolfgang G. Mayr and Karl W. Stumpf, Summer 1993*



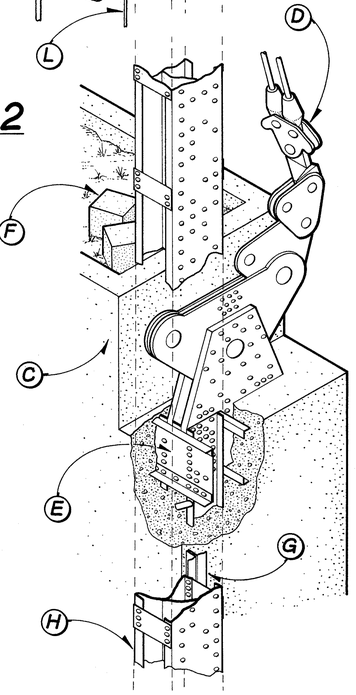
Legend

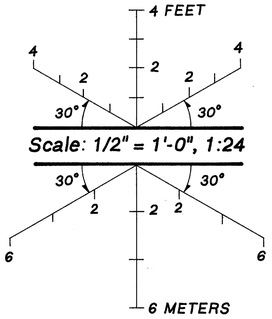
A. Cast Steel Sheave
B. Steel Counterweight Cables
C. Counterweight
D. Equalizing Lever (Counterweight)
E. Counterweight Frame
F. Adjustment Weights
G. Counterweight Guide Frame
H. Tower Post
I. Deflecting Sheave
J. Rollers (Lift Span Guide)
K. Steel Spring (Lift Span Guide)
L. Raising Rope
M. Lowering Rope
N. Upper Chord (Lift Span)
O. Equalizing Lever (Lift Span)
P. Cable Drums
Q. 75 H.P. D.C. Motor
R. Reduction Gears
S. Drive Shaft

Detail 1

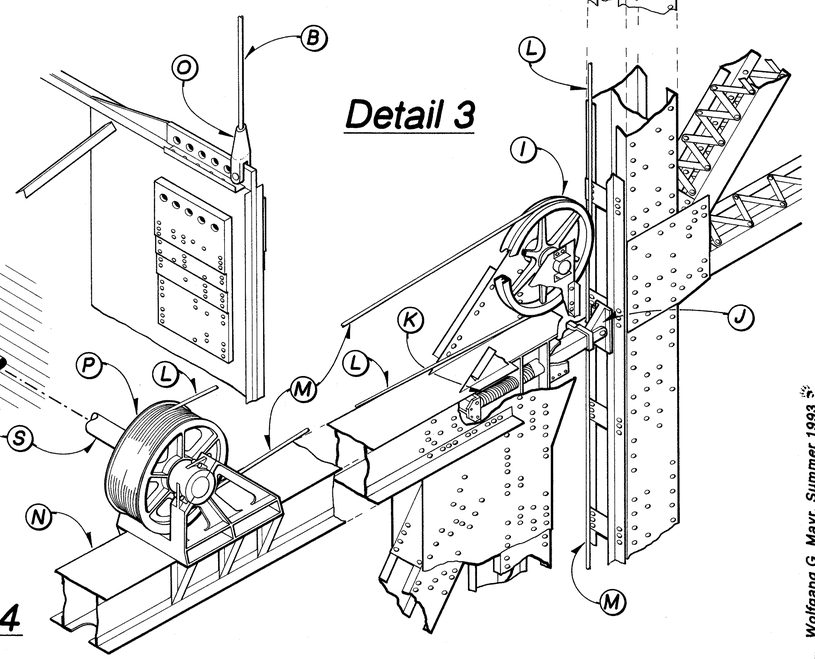


Detail 2





Detail 3



Detail 4

Detail 5

Axonometric -

Section at Lift Span, East Half

HISTORIC AMERICAN ENGINEERING RECORD WA-100

SHEET 2 OF SHEETS 2

WASHINGTON

CITY WAYERWAY (11TH STREET) BRIDGE - 1911
STATE ROUTE 509 SPANNING CITY(THEO FOSS) WATERWAY
PIERCE COUNTY

IF REPRODUCED, PLEASE CREDIT HISTORIC AMERICAN ENGINEERING RECORD, NATIONAL PARK SERVICE. NAME OF DELINEATOR, DATE OF THE DRAWING

DRAWN BY: Wolfgang G. Mayr, Summer 1993

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TACOMA