1. SITE I.D. NO				HAER INV	ENTORY		Historic American Engineering Record Department of the Interior, Washington, D.C.		
2. INDUSTRIAL CLASSIFICATION			7.	3. PRIORITY	4. DANGER OF DEMOLITION?			N	
Bridges, Trestles, a	nd Aqueducts 7	6	5 3	1	(SPECIFY THREAT)	_			
MOVE: vertical lift	2749	_	•	^{5. date} 1911/57	6. GOVT SOURCE OF THREAT	OWNER			
State Number: 509/5	509500002200				State Departmen	t of Transporta	tion		
8 NAME(S) OF STRUCTURE City Waterway Bridge					9.0WNER'S ADDRESS Highway Adminis Olympia, Washing		g		
10. STATE W A COUNTY NAME COUNTY 0 5 3 Pierce		COMa		CONG. DIST. 03	COUNTY				
11th Street					SURVEYS				
1.6 N Jct. SR 5					13. SPECIAL FEATURES (DESCRIB		INTACT	ENVIRONS INTACT	
14. UTM ZONE EASTING	NORTHING 5 0 5 2 3	333	3 0	SIGN SCALE	21:24 1:62.5	QUAD . NAME .	Tacoma North, b	lashington	
1 9 5 4 3		340	0 0	SIGN SCALE	1:24 1:62.5 OTHER	QUAD NAME			
15. CONDITION 70 CEXCELLENT	71 GOOD 72	FAIR	73	DETERIORATED	74 RUINS 75 UNEX	POSED 76 ALTERE	D 82 DESTROYED	85 DEMOLISHED	
16. INVENTORIED BY Lisa Soderberg				AFFILIATION HAER/Wa	shington State Br	idge Inventory	March 1	979	
¹⁷ DESCRIPTION AND BACKGROUND HIST MATERIALS, EXTANT EQUIPMENT, AND began the constructi the tidal flats, eas flanked by two 190 f which was over 1100 reinforced concrete The west approach is deck was originally of the trusses on ca The lift span w	on of the City t of the city. oot fixed rivet feet long has n retaining wall, of double deck paved with wood ntilever bracke	Water The ed Pr ow be and cons cons blocks.	rway 3200 ratt een r 475 struc ck, a	Bridge to cor foot bridge truss spans. eplaced by st feet of steel tion providir nd is 50 feet	nnect Tacoma's bus includes a 214 fo The original tim ceel and concrete. -girder and colum ng access to the w	iness center wi ot riveted Prat ber trestle on The west appr n viaduct which ater level via rb. Two 10 foo	th the manufac t vertical lif the east side coach consists n rises to a he a 19 foot road ot sidewalks ar	t span which is of the bridge of a 100 foot ight of 78 feet way. The main e carried outsi	
18. ORIGINAL USE				NTUSE		ADAPTIVE USE			
Bridge/vehicular				<u>dge/vehicular</u>	a 	l	<u></u>	· · · · · · · · · · · · · · · · · · ·	
City Public Works De			INCH						
State Department of			s.						
J.A.L. Waddell, Brid				(New York, 1	1916) 1:734.746.				
"The City Waterway B						p. 1010.		(CONT OVER)	
20. URBAN AREA 50,000 POP. OR MORE? YES NO	21, HCRS REGION		UBLIC AC		YES, LIMITED ZYES, UNLIM	IITED		23. EDITOR INDEXER	
24. LOCATED IN AN HISTORIC DISTRICT?			IE				ST (.D. NO	5	
FHR-8-260 1/79								فتشادا بالاستخاذ كفاعه والبويسية ويعيدوه	

Kansas City, Missouri. It is similar to other Waddell and Harrington designs; in particular, it resembles the Puyallup River Bridge, a shorter spanned bridge located on 11th Street only a few blocks away. When the City Waterway Bridge was built, it gained the distinction of being one of the highest lift bridges ever constructed, and the only lift bridge built on a grade. The lift span consists of a simple truss span suspended at its four corners by plow steel cables which rise over cast-steel sheaves at the top of the towers, and connect to two 400 ton counter-weights which balance the dead weight of the lift span and the machinery.

Description (continued)

The counter-weights are plain concrete poured about a steel frame, to which the equalizers are attached by pin connections. The dimensions of these counter-weights are 6 feet 6 inches by 17 feet 3 inches by 50 feet 9 inches. Three thousand tons of structural steel, which included the plow steel cables, was fabricated by the American Bridge Company. Tower posts were shipped from the shop in two sections, and were spliced in the middle in the field.

In his 1916 edition of <u>Bridge Engineering</u>, J.A.L. Waddell claimed that the peculiar features of the City Waterway Bridge were the "unusually great height of the deck above the water and the overhead span for carring pipes." At high tide, the clearance is 135 feet with the span up, and 60 feet with the span down, providing a clear waterway 200 feet wide. A light truss span was constructed between the two towers to carry a 16 inch water main across the waterway to the tide flats. The Main was carried up the shore piers, over the tops of the fixed span trusses, up the back of the towers, and across the overhead truss span.

The lift span and trusses rest on four Fowler patent concrete piers. Because of the silt and sand bottom, the preparation for the foundation of the piers was difficult. Twelve by twelve fir timber cribs with an opening of 21 x 81 feet were constructed, and sunk to a depth of 54 feet below high water. Two hundred piles were driven into the two central piers, and 150 piles into the two end piers. The piles were of special selected fir stock, and were up to 125 feet long with a top not less than eight inches in diameter. The piles were driven to a maximum penetration of 106 feet below the cutting edge, or 160 feet below the pile driver. After the piles were driven, the cribs were pumped free of water. Bases of plain concrete, 30 feet thick were then poured.

Originally a double-track street railway was carried in the center of the roadway. The operating machinery located in the house on the top chord of the suspended truss was actuated by motors connected to the street-railway circuit. The equipment which could raise or lower the span in half a minute, consisted of two 75 horse power D.C. Westinghouse motors of the railroad type, and operated in series, driving the hoisting drums through eight-inch shafts. In the 1912 article in <u>Engineering News</u>, it was noted that the innovation of electrically driven gates operated from the motor house closed each of the approach spans before the bridge could be raised. In an emergency, an auxiTiary capstan could be operated by hand power to raise or lower the bridge in $3\frac{1}{2}$ hours.

The City Waterway Bridge is significant as an early example of a vertical lift bridge designed by the renowned engineers, Waddell and Harrington. In 1916, Waddell accurately interpreted the importance of the vertical lift bridge in relation to other moveable structures. He wrote that the type had come to stay, and that it would continue to be used more and more as time went on, "for not only is it inexpensive in first cost comparatively speaking, but it is also simple, rigid, easy to operate, and economical of power. It has met with considerable opposition up to the present time, mainly from the owners of bascule patents; but it has overcome that opposition most satisfactorily and unequivocally, consequently the future of the type may be counted upon as assured."

"The Eleventh Street Steel Bridge, Tacoma," Engineering-Contracting Number, 12 April 1913, pp. 232-234.



GPO 937 842

25. Photos and Sketch Map of Location



City Waterway Bridge

