					0/	AHP			Y		Department	of the Inte	erior , Washin	gton, D	D.C. 2024
Classification Bridges, Trestles, and A	Aqueduct	s			3. P			4. DANGER OF (SPECIFY T	DEMOLITIO	SN5	YES	NO		VN	
ARCH: steel		7	5	q	6 ^{5. C}	DATE		6. GOVT SOUR	CE OF THR		OW	NER	ADMI	N	
			15			1913	-14		MIN						
#58						1510	• •	Citv	of Se	attle					
NAME(S) OF STRUCTURE			1	1				9. OWNER'S A	DDRESS						
Ravenna Park Bridge								Engi Seat Seat	neerin tle Mu tle, N	ng Depart Inicipal Jashingto	cment Building on 98104	, Room 7	704		
STATE W A COUNTY NAME	c	ITY/VICIN	ITY			CONG.		STATE		COUNTY NAME		CITY/VICI	NITY		
COUNTY 0 33 King		Seat	tle		ľ	DIST.	0 3	COUNTY							IST.
SITE ADDRESS (STREET & NO)								12. EXISTING	N R	N HL	HABS	HAER-I	HAER	N P	s 🔲 c
20th Avenue North East	Crossin	g: R	lave	nna	Park	Ravi	ne			CONF	STATE	COUNT	Y DLOCA	- 0	OTHER
S.T.R.: 9 25N 4E	,							13. SPECIAL FI	EATURES	ESCRIBE BELOV	N)			-	
					lei	GN						OR INTACT			IVIRONS INT.
	0 5 2	7 9	8	6 0	3		SCALE		1:62.5		QUA	p Seat	tle North	, Wast	nington
UTM ZONE EASTING	NORTHING	G	<u> </u>		SI	GN	SCALE	П 1:24	□ 1:€2.5						
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CONDITION 70 EXCELLENT	71 0 GOOD	72	FAIR		73 🗖 DE	TERIORAT	TED	74 🗖 RUINS	75	UNEXPOSED	76 🗖 ALT	ERED	82 DESTROYED	8	5 DEMOLIS
INVENTORIED BY						AFFIL							DATE		
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Description(continued) verticals are made up of two angles that are latticed together.

The arch spans are braced by sway frames at each panel point. Longitudinal bracing is used in the end panels of the arch span. In addition, there are three lateral systems.

Spandrel columns consisting of channels and lattice bars are riveted to the arch ribs. The columns support an 18-foot wide reinforced concrete roadway as well as two 6-foot wide sidewalks that are cantilevered over the trusses.

The firm sandy clay soil on either side of the gulch allowed the construction of economic foundations which could support the horizontal thrust of the arch structure. The foundations were constructed of concrete which was mixed in a one-half yard Ransome mixer situated on the south bank. The concrete was transported by cableway down the centerline of the bridge. The skewbacks and abutments were poured from this location by means of a chute.

Concrete was also used in the railing on the wingwalls. The design and construction of the reinforced concrete railing was unique. Because the rail was curved with triangular openings, each panel was precast.

The graceful steel structure that carried pedestrians and motor vehicles over the forested trails of Ravenna Park was a three-hinged lattice arch. The design engineer, Mr. Frank M. Johnson, explained that "it was desirable from the standpoint of rigidity and appearance to build a two-hinged arch, but as a slight settlement of an abutment induces large stress in the members of this type, and as the skewbacks were not formed on solid rock, the three-hinged arch was the most practical to use." The three-hinged arch, with a hinge at the crown and at the two abutments, was widely used by American engineers. Although it is the least rigid of all arch structures, there is no ambiguity of stress distribution and the method of stress calculation is relatively simple.

It was not necessary to construct an unusually heavy or rigid bridge. The Ravenna Park bridge was to serve as a link for cars and pedestrians, and would not accommodate the heavier loadings of electric street railways. Due to the location of their existing lines, the Electric Railway Company decided to construct separate lines to each residential district rather than building a line across the park.

Three hundred tons of structural steel, fabricated by the Ambridge Plant of the American Bridge Company, was used in the bridge. The bridge was designed and constructed under the direction of the city Engineer's office. Mr. A.H. Dimock was the city engineer; Mr. Frank M. Johnson was the designing engineer; and Mr. J.A. Dumford was the superintendent of construction. J.R. Wood and Company of Seattle were the contractors.

The Ravenna Park Bridge is the oldest, and one of two three-hinged lattice arches remaining within the State. Even during the time of its construction the steel arch was used in the United States only when very specific conditions prevailed. In his book <u>Bridge Engineering</u>, J.A.L. Waddell explains the reason for the paucity of arches in the United States. "Arches are employed very generally in Europe on account of their superior appearance as compared with simpletruss bridges, and because of the powerful influence of the old masonry arch upon the minds of European bridge designers regardless of the consideration of the economy.

The Ravenna Park bridge design did prove to be an economical solution to the problem of spanning the ravine. However, unlike much American bridge construction, the consideration of aesthetics played an important role in the design of the park bridge. The engineer was careful to choose a bridge design that mirrored the park setting. He articulated the rationale behind his design: "Since the lines of nature are curves, the arch was considered to be the most pleasing [bridge] type. Aesthetic satisfaction comes from art deduced from nature, and the simpler the function of a system, the better it will be understood and appreciated." The design engineer claimed that the arch rib is well understood, and that the expressive lines of the curved form clearly define their functional purpose. "Conformity with the environment

ABSTRACT						
HAERNO	LC	TECH REPORT	HIST REPORT C	СОЛТЕМР РНОТО НІЗТ РНОТО	CONTEMP DRWG HIST DRWG COLOR F	LATE PHOTOGRAM SW FILM
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Ravenna Park Bridge

Description (continued)

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did not demand a large amount of ornamentation,' he continued, 'the major portion of which is lost at a short distance; the main lines of the structure giving the general effect . . . " The only hint of ornamentation lies in the facia plates that were placed over the ends of the stringers on each side of the deck slab giving the effect of a series of undulating arches mirroring the arched form of the bridge. The unusual power of the bridge rising above the wooded ravine lies in the straightforward delineation of the structure's function through the stark steel forms.

25. Photos and Sketch Map of Location

