Maryland Historical Trust	MHT#				
Maryland Inventory of Historic Properties Number: H-37.	HA-1982				
Maryland Inventory of Historic Properties Number: H-37. HA-1982 Name: Forge Hell Relove Described.					
The bridge referenced herein was inventoried by the Maryland State Highway Administration as part of the Historic Bridge Inventory, and SHA provided the Trust with eligibility determinations in February 2001. The Trust accepted the Historic Bridge Inventory on April 3, 2001. The bridged received the following determination of eligibly.					
MARYLAND HISTORICAL TRUS					
	ity Not Recommended				
Criteria:ABCD Considerations:AB	_CDEFGNone				
Comments:					
Reviewer, OPS:Anne E. Bruder	Date:3 April 2001				
Reviewer, NR Program:_Peter E. Kurtze	Date:3 April 2001				

MARYLAND INVENTORY OF HISTORIC BRIDGES HISTORIC BRIDGE INVENTORY MARYLAND STATE HIGHWAY ADMINISTRATION/ MARYLAND HISTORICAL TRUST

SHA Bridge	e No. <u>H-37</u>	Bridge name Forge Hill	Road over Deer Creek	
I OCATION	NT.			
LOCATION Street/Road		er [facility carried] For	ge Hill Road	
20100721000		<u> </u>		
City/town	Dublin		VicinityX	
County	Harford			
This bridge	e projects over: R	oad Railway	Water X	_ Land
Ownership	: State	CountyX	Municipal Ot	her
HIST <u>OR</u> IC	STATUS:			
		a designated historic disti	rict? Yes	No
Nat	ional Register-lis	ted district Natio	nal Register-determined-eli	igible district _
Loca	ally-designated di	strictOther		
Name of di	strict			
<u>BRIDGE T</u> Timber Bri	<u>YPE:</u> dge:			
		Truss -Covered	Trestle Timber-Ar	nd-Concrete
Den				d concrete
Stone Arch	Bridge	_		
Metal Trus	s Bridge	_		
Movable Br	ridge:			
	ng		eaf Bascule Multip	
Vert	tical Lift	Retractile	Pontoon	
Metal Gird	er	_:		
Roll	led Girder	_ Rolled Girder Co	ncrete Encased	_
Plat	te Girder	_ Plate Girder Con	crete Encased	_
Metal Susp	ension	_		
Metal Arch	·			
Metal Cant	ilever	_		
Concrete	_X:			
		_ Concrete Slab	Concrete Beam Rigic	d Frame
Other	Type Nam	e		
	_ 			

DESCRIPTION: Setting: Urban	Small town	Rural	X
Describe Setting:			
Bridge H-37 carries Forge north-south and Deer Cree State Park, and is surround	ek flows east. The bridge is		
Describe Superstructure a	nd Substructure:		
Bridge H-37 is a 3-span, 2-structure is 65.8 meters (2 inches); there are no side superstructure consists of concrete parapets. The brida bituminous wearing surfapproaches have metal gu concrete piers. The bridge	216 feet) long and has a clewalks. The out-to-out wid a arches which support trace is a closed spandrel ribeface. The structure has pardrails. The substructure	ear roadway width of dth is 6.3 meters (20 ansverse floor beam concrete arch bridge, pierced concrete par- re consists of 2 con	of 5.9 meters (19 feet 2 0 feet 10 inches). The is, a concrete deck and 1. The concrete deck has apets and the roadway increte abutments and 2
According to the 1995 inspection report, this structure was in poor to extremely poor condition with overall deterioration. The asphalt wearing surface has small patches and potholes. The concrete arches are spalled and have exposed reinforcement bars. The underside of the deck has deteriorated. The abutments are honeycombing and cracking. The piers are spalling, scaling, and eroding. Also, the concrete parapets are in poor condition. They are heavily spalled with exposed reinforcement bars.			
Discuss Major Alterations	:		
There have been no major	alterations to the bridge.		
HISTORY:			
WHEN was the bridge builthis date is: ActualSource of date: PlaqueOther (specify):	Design plans		es/inspection form X
WHY was the bridge built?	?		
The bridge was constructed increased load capacity.	l in response to the need fo	or more efficient tran	sportation network and
WHO was the designer?			
Harford County			

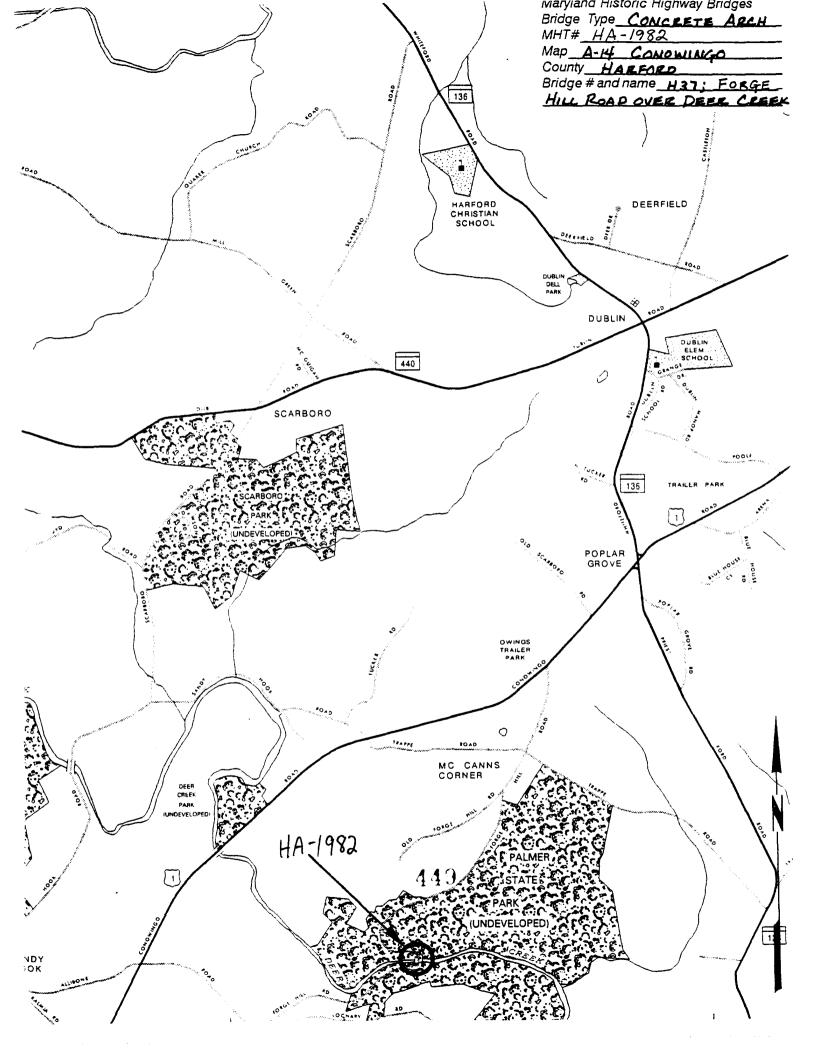
WHO was the builder?	
Harford County	
WHY was the bridge altered?	
N/A	
Was this bridge built as part	of an organized bridge-building campaign?
Unknown	
SURVEYOR/HISTORIAN AN	ALYSIS:
	al Register significance for its association with:
	B- Personectural character X
The bridge is eligible for the N	(ational Perister of Historia Places under Criterian C. as a significa

The bridge is eligible for the National Register of Historic Places under Criterion C, as a significant example of concrete arch construction. The structure has a high degree of integrity and retains such character-defining elements of the type as pierced parapets, arch ribs and struts, closed spandrel walls, abutments, and piers.

Was the bridge constructed in response to significant events in Maryland or local history?

The advent of modern concrete technology fostered a renaissance of arch bridge construction in the United States. Reinforced concrete allowed the arch bridge to be constructed with much more ease than ever before and maintained the load-bearing capabilities of the form. As the structural advantages of reinforced concrete became apparent, the heavy, filled barrel of the arch was lightened into ribs. Spandrel walls were opened, to give a lighter appearance and to decrease dead load. This enabled the concrete arch to become flatter and multi-centered, with longer spans possible. Designers were no longer limited to the semicircular or segmental arch form of the stone arch bridge. The versatility of reinforced concrete permitted development of a variety of economical bridges for use on roads crossing small streams and rivers.

Maryland's roads and bridge improvement programs mirrored economic cycles. The first road improvement of the State Roads Commission was a 7 year program, starting with the Commission's establishment in 1908 and ending in 1915. Due to World War I, the period from 1916-1920 was one of relative inactivity; only roads of first priority were built. Truck traffic resulting from war related factories and military installations generated new, heavy traffic unanticipated by the builders of the early road system. From 1920-1929, numerous highway improvements occurred in response to the increase in Maryland motor vehicles from 103,000 in 1920 to 320,000 in 1929, with emphasis on the secondary system of feeder roads which moved traffic from the primary roads built before World War I. After World War I, Maryland's bridge system also was appraised as too narrow and structurally inadequate for the increasing traffic, with plans for an expanded bridge program to be handled by the Bridge Division, set up in 1920. In 1920 under Chapter 508 of the Acts of 1920 the State issued a bond of \$3,000,000.00 for road construction; the primary purpose of these monies was to meet the state obligations involving the construction of rural post roads. The secondary purpose of these monies was to fund (with an equal sum from the counties) the building of lateral roads. The number of hard surfaced roads on the state system grew from 2000 in 1920 to 3200 in 1930.





HA-1982 HARFORD COUNTY HD JOHN TAKQUIMO 23 JAN 1995 HARYLAND SHPO SHA STATE HIGHWAY BRIDGE NO. H37 VIEW LOOKING MORTH ON FORGE HILL ED.



HA- 1982 HARFORD CO. MO JOHN TARQUINIO 1/23/95 MARYLAND SHPO SHA STATE HIGHWAY BRIDGE H37 VIEW LOOKING WEST FROM THE NORTH END OF BRIDGE



HA-1987 HARFORD COUNTY, MD JOHN TARQUINIO 23 JAN 1995 HARYLAIND SHPD SIM STATE HIGHWAY BRIDGE H37 VIEW LOOKING EAST. VIEW LOOKING EAST. 3/4



HARFORD COUNTY, HU

JOHN TARQUINDO

23 JAN 1995

MARYLAND SHPO SHA

STATE HIGHWAY ADMIN BRIDGE H37

VIEW LOOKING, SOUTH ON

FORGE HILL RD

4/4

INDIVIDUAL PROPERTY/DISTRICT MARYLAND HISTORICAL TRUST INTERNAL NR-ELIGIBILITY REVIEW FORM

Property/District Name: Forge Hill Road Bridge over Deer Creek (H-37) Survey Number: HA-1982
Project: Bridge Rehabilitation Agency: FHWA/Harford County DPW
Site visit by MHT Staff: X no yes Name Date
Eligibility recommended X Eligibility not recommended
Criteria:AB _X_CD Considerations:ABCD _EFGNone
Justification for decision: (Use continuation sheet if necessary and attach map)
The Forge Hill Road Bridge over Deer Creek, Harford County, Maryland is a concrete arch bridge which was constructed based on designs by the noted Architect and Engineer, Albert Kahn. This bridge was determined to be eligible by the Interagency Historic Bridge Committee based on information which stated that the bridge was built in 1925. However, Harford County indicates that the bridge was actually designed in 1911 as evidenced by its photograph and short blurb in the December 30, 1911 <i>Engineering Record</i> . Layton F. Smith designed the bridge, incorporating Kahn's system of reinforcement. The County proposes to replace the parapet, however the replacement will be in-kind use of materials and form. Therfore, the bridge remains eligible for inclusion in the National Register of Historic Places under Criterion C (Engineering).
Documentation on the property/district is presented in: Project Review and Compliance files
Prepared by: Julio Espinoza, County Engineer
Anne E. Bruder October 25, 1999
Reviewer, Office of Preservation Services Date
NR program concurrence: yes no not applicable
Reviewer NR program

206

MARYLAND COMPREHENSIVE HISTORIC PRESERVATION PLAN DATA - HISTORIC CONTEXT

I.	Geographic Region:			
	Eastern Shore	(all Eastern Shore counties, and Cecil)		
	Western Shore	(Anne Arundel, Calvert, Charles, Prince George's and St. Mary's)		
X	Piedmont	(Baltimore City, Baltimore, Carroll,		
	_	Frederick, Harford, Howard, Montgomery)		
	_ Western Maryland	(Allegany, Garrett and Washington)		
II.	Chronological/Developmental	Periods:		
	_ Paleo-Indian	10000-7500 B.C.		
	Early Archaic	7500-6000 B.C.		
•	Middle Archaic	6000-4000 B.C.		
	_ Late Archaic	4000-2000 B.C.		
	Early Woodland	2000-500 B.C.		
	Middle Woodland	500 B.C A.D. 900		
	Late Woodland/Archaic	A.D. 900-1600		
	Contact and Settlement	A.D. 1570-1750		
	Rural Agrarian Intensification	A.D. 1680-1815		
	Agricultural-Industrial Transition	A.D. 1815-1870		
X	Industrial/Urban Dominance	A.D. 1870-1930		
	Modern Period	A.D. 1930-Present		
	Unknown Period (prehistoric	e historic)		
III.	Prehistoric Period Themes:	IV. Historic Period Themes:		
	Subsistence	Agriculture		
	Settlement	Architecture, Landscape Architecture,		
		and Community Planning		
	_ Political	Economic (Commercial and Industrial)		
	_ Demographic	X Government/Law		
	Religion	Military		
	Technology	Religion		
	Environmental Adaptation	Social/Educational/Cultural		
	<u>.</u>	X Transportation		
V. R	esource Type:			
	Category: Structure			
	Category: <u>Structure</u> Historic Environment: Rur			
	Historic Function(s) and Use(s):			
	Known Design Source: Law			

HARFORD COUNTY, MARYLAND

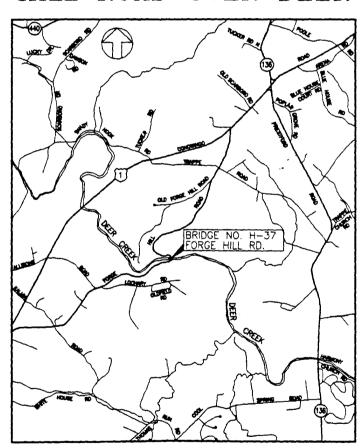
DEPARTMENT OF PUBLIC WOI

SHA CONTRACT NO. FEDERAL AID PROJECT NO.

HARFORD COUNTY BID NO. ..-..

REHABILITATION OF BRIDGE NO. H-3

FORGE HILL ROAD OVER DEER CREEI



LOCATION MAP

LENGTH OF THE PROJECT = 400.00 FEET

ETS

OCATION MAP

PLAN SECTION AND DETAILS) PROFILE ILES

MENT CONTROL PLAN
MENT CONTROL DETAILS
MENT CONTROL DETAILS
MENT COMMOD DETAILS
ELEVA

EXTERIOR
 INTERIOR
 EXTERIOR
 INTERIOR
 E REPAIRS

YEAR	DESIGN YEAR	REMARKS	
95)			
	 		
OAD			

BRIDGE NO. H-37 FORGE HILL ROAD OVER DEER CREEK

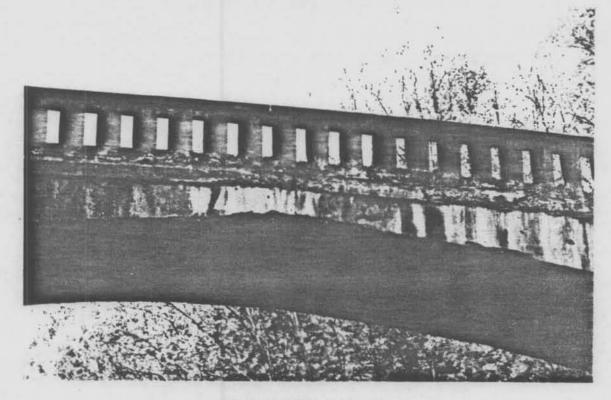


PHOTOGRAPH NO. 1 LOOKING NORTH

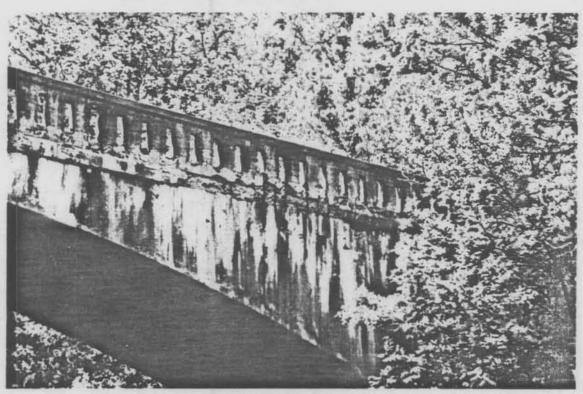


PHOTOGRAPH NO. 2 LOOKING SOUTH

BRIDGE NO. H-37 FORGE HILL ROAD OVER DEER CREEK



PHOTOGRAPH NO. 15
DETERIORATED CONCRETE ARCH (EAST SIDE)



PHOTOGRAPH NO. 16
DETERIORATED CONCRETE ARCH (EAST SIDE)

Maryland Historical Trust State Historic Sites Inventory Form

MARYLAND INVENTORY OF HISTORIC PROPERTIES

Surve	No.	на-1982
Magi 1	<i>No</i> .	
DOE	yes	no

1. Nam	e (indicate pre	ferred name)		
historic Fo	orge Hill Road Bridg	e (preferred)		
and/or common	Bridge H-37			
2. Loca				
street & number	3000 Blo	ck Forge Hill Road	_	not for publication
city, town $_{ m Du}$	ıblin	vicinity of	congressional district	2n d. (2)
state Ma	arykand	county	Harford	
	sification			
Category district building(s)X structure site object	Ownership Xpublic private both Public Acquisition in process being considered not_applicable	Status occupied unoccupied work in progress Accessible yes: restricted yes: unrestricted no	Present Use agriculture commercial educational entertainment government industrial military	museum park private residence religious scientific X transportation other:
4. Own	er of Prope	ty (give names a	nd mailing addresse	s of <u>all</u> owners)
name Han	5 1 00 1 0	Dublida Hanley De		
street & number	rford COunty Governm			o.: 410-638-3285
<u></u> -	200 South Bond St			
5 Loca	Bel Air ation of Lega		- 110	21014
J. LUC	ation of Legi	ai bescription		
courthouse, regi	stry of deeds, etc.			liber
street & number				folio
city, town			state	
6. Rep	resentation	in Existing	Historical Surv	reys
title				
date			federal sta	te county loc
ository for scر	urvey records	·		
city town			state	

7. Description			Survey No.		
Condition excellent good fair	_X_ deteriorated ruins unexposed	Check one _X_ unaltered altered	Check one _X_ original site moved date of move		

Prepare both a summary paragraph and a general description of the resource and its various elements as it exists today.

SEE ATTACHED SEPARATE SHEETS

8. Sig	nificance		Survey No.	1982
Period prehistor 1400–149 1500–159 1600–169 1700–179 1800–189X 1900–	99 archeology-historic c 99 agriculture e 99 architecture e 99 art e 99 commerce e communications iii	• •	law literature military music t philosophy	science sculpture social/ humanitarian theater
Specific dat	es 1911 Build	er/Architect Stat	te Roads Commission	Lautan Codel
-	plicable Criteria: _A _B and/or plicable Exception: _A	<u>X</u> C <u>D</u>	des	signer
Le	evel of Significance:nati	onalstate	local	
Prepare bo	th a summary paragraph of si	gnificance and	a general statement	of history and

SEE ATTACHED SHEETs

Major Bibliographical References

Survey No. <u>HA-1982</u>

Engineering Record December 30,1911 Reports of the State Roads Commission 1911

10. Geogra	phical Data			
Acreage of nominated pro Quadrangle name Bel A UTM References do NO	· · · · ·	ences	Quadrangle scale <u>1:2400</u>	0
Zone Easting	Northing	B Zone	Easting Northing	
C		D		⊥
Verbal boundary descr	iption and justification The boundaries co	onsist of the	bridge itself.	
List all states and cou	nties for properties overl	apping state or c	county boundaries	
state	code	county	code	
state	code	county	code	
11. Form P	repared By			
name/title Christo	oher Weeks			
organization Preserva	ation Planner, Harfor	rd County C	date January 19, 2990	
street & number 220 So	outh Main Street	t	telephone 410-638-3103	
city or town Bel A:	ir,	s	state MD 21014	
	-			

The Maryland Historic Sites Inventory was officially created by an Act of the Maryland Legislature to be found in the Annotated Code of Maryland, Article 41, Section 181 KA, 1974 supplement.

The survey and inventory are being prepared for information and record purposes only and do not constitute any infringement of individual property rights.

return to:

Maryland Historical Trust MARYLAND HISTORICAL TRUST. Shaw House

21 State Circle Annapolis, Maryland 21401 CROWNSVILLE, MD 21032-2023 (301) 269-2438

DHCP/DHCD 100 COMMUNITY PLACE

514-7600

HA-1982 Forge Hill Road Bridge Harford County 7.1

Summary

Bridge H-37 is a three-span, two-lane reinforced concrete bridge that carries Forge Hill Road over Deer Creek in north-central Harford County, Maryland. The bridge is located in the heavily forested Palmer State Park near the hamlet of Dublin; it is cited as a contributing element of the Lower Deer Creek Valley National Register Historic District. Forge Hill Road generally runs north-south; Deer Creek flows easterly from Baltimore County to the Susquehanna River.

General Description

The following is from the *Engineering Record* of December 30, 1911 (Vol. 64, No. 27), pp. 761-62:

"Recently completed by the State Roads Commission," the Forge Hill Road Bridge's "main arch has a clear span of 100 ft. with a rise of 11 ft. and the side arches have half spans of 45 ft. with a rise of 8 ft. 9 ins. The total length of the bridge, between abutments, is 210 ft. and wing walls at either abutment increase the overall distance to 248 ft. The roadway in the clear is 18 ft. 4 in. The Kahn system of reinforcement is used throughout the structure. A clause in the specifications required individual bars and suggested that shear members be rigidly attached to main tension members.

"The framing comprises four individual piers, with mass concrete footings, supporting the two arch ribs. These ribs support transverse floorbeams and on these the bridge floor is laid.

"The footings for the four piers are carried to solid rock and brought to a uniform elevation of 123 ft. Eight cup-bar dowels 4 ft. long are anchored 2 ft. in these footings...and, with eight $1 \frac{3}{4} \times 2 \frac{3}{4}$ -in. trussed bars lashed to them, provide anchorage and reinforcement to the piers. The piers, 6 ft. 8 in. by 14 ft. at the base, are batterd to 2 x 10-ft. at the springing line, El. 137, to conform to the arch rib section. At the springing line they are tied transversely by a concrete beam of 2 x 2-ft. section, reinforced at the top and bottom by two $1 \frac{1}{2} \times 2 \frac{1}{4}$ - in. trussed bars, 20 ft. long, spaced 12 in. on centers. The two arched ribs, parabolic in section at the intrados and horizontal at the extrados, have a crown thickness of 3 ft. and a width of 2 ft....

"The floorbeams have a clear span of 16 ft. 4 in., a thickness of 24 in. at the ends and 27 in. at the center and are 1 ft. wide. They are reinforced with two $1\frac{3}{4} \times 2\frac{3}{4}$ -in. trussed bars 18 ft. 3 in. long....The floor slab has a clear span of 9 ft. and a depth of $8\frac{1}{2}$ in.....The curb 10×24 in. carries a reinforced concrete railing of simple open panel design....To provide for drainage, the bridge is built on a rising grade from either end of 1.9 per cent., and 2-in. drainage spouts are placed at either curb 25 ft. apart." The span

HA-1982 Forge Hill Road Bridge Harford County 7.2

boasts pierced concrete parapets which might be viewed as guard rails that in effect appear to be decorative balustrades.

The *Engineering Record* notes that, "According to Mr. Layton F. Smith, the designing engineer, this bridge was designed for the ribs to act as cantilevers 110 ft. long, with the middle 10 ft. resting on the piers....By considering the ribs as cantilevers, the load is transmitted vertically to the foundations.

"There were three different mixtures of concrete used in construction. For beams and columns the proportions were 1:2:4; for floor plates and footings 1:2 1/2: 5; and for slabs under 3 in., one part of cement to three parts of fine aggregate were used. Broken stone was used in all cases." Once the abutments and piers were in place, "the rest of the concrete to the under side of the hand rail was poured continuously for 88 hours."

The bridge was designed by Layton Smith, a Baltimore-based consulting engineer, under the general supervision of W.W. Crosby, chief engineer of the State Roads Commission. E. Ward Brown served as general contractor, with Daniel Morgan superintendent.

A 1995 inspection report deemed the bridge in poor condition with overall deterioration. The roadway has small patches and potholes. The concrete arches are spalled and have exposed reinforcement bars. The underside of the deck has deteriorated. The abutments are honeycombing and cracking. The piers are spalling, scaling, and eroding. The concrete parapets are also spalling with exposed reinforcement bars.

HA-1982 Forge Hill Road Bridge Harford County 8.1

Summary

The Forge Hill Road Bridge, completed in 1911, stands as one of the newly formed State Roads Commission's first efforts to improve and upgrade Maryland's highway network. It is also an early (and fine) example of reinforced concrete construction.

History and Support

The Forge Hill Road Bridge was built as part of the State Roads Commission's ongoing effort to provide a more efficient transportation network. Specifically, it was part of a seven-year program that began with the Commission's establishment in 1908 and ended in 1915.

This burst of activity coincided with the advent of modern concrete technology. The first known concrete houses in the then-booming Baltimore, located in Roland Park, date to 1905, just six years before the Forge Hill Bridge spanned Deer Creek in a remote stretch of Harford County.

Reinforced concrete allowed the arch bridge to be constructed with much more ease than before and maintained the load-bearing capacity of the form. As the structural advantages of reinforced concrete became clear, overall bridge design was lightened. Its arch design is significant: the era the bridge was built coincides with an era in which concrete bridge design was increasingly standardized, with beam and slab constituting 65% of all construction. Yet as consultant P.A.C. Spero has noted, "it appears that the arch was selected when aesthetic as well as other site conditions were considered." It is thus interesting that the Commission chose the more aesthetically pleasing arch design for this somewhat remote span.

The "new" Forge Hill Road Bridge was built to replace an earlier structure a few yards upstream, which required that the road be relocated and realigned. And in addition to its aesthetic appeal, the new Forge Hill Bridge offered practical advantages over the earlier span. As the 1911 State Roads Commission reports notes, "this [new bridge] is one of the greatest improvements your Board has completed. The grades on the old crossing of Deer Creek were as high as 16 per cent. And the old road was utterly impassable for considerable periods each year. The new road has no grade over 7 percent."

Moreover, "the new bridge is a fine example of permanent work. It is of reinforced concrete of unusual design and its cost (\$10,000) was only a few hundred dollars in excess of the usual type of steel and wood structure of equal strength. Considering its freedom from maintenance charges, its cost over a period of years should be less than that of a steel structure."

HA-1982 Forge Hill Road Bridge Harford County 8.2

The bridge is cited as a contributing element to the Lower Deer Creek Valley National Register Historic District.

MARYLAND HISTORICAL TRUST						
Eligibility Recommended X	Eligibility Not Recommended					
Criteria: XA BXC D Considerations:	_ABCDEFGNone					
Comments: The bridge contributes to the Lower Deer Creek Valley Historic District, and is also individually						
eligible as an engineering example (Criteria A and C). It was determined to be eligible for the National Register						
of Historic Places by the Interagency Historic Bridge Committee and the Trust's concurs with that determination.						
Reviewer, OPS: Alf Mich						
Reviewer, NR Program: FEKUNTY	Date: 5/17/00					

Jakol V

HA-1772

MARYLAND COMPREHENSIVE STATE HISTORIC PRESERVATION PLAN STATEWIDE HISTORIC CONTEXTS

I. Geographic Organization

Piedmont

II. Chronological/Development Period

Industrial/Urban Dominance

III. Historic Period Theme

Transportation

IV. Resource Type

Structure

Rural Environment

Historic Function: Bridge

Design Source: Layton Smith, engineer

HA-1982 Forge Hill Road Bridge Dublin vic. Harford County Bel Air Quad VILLERING 7.4 MI 5763 III NE (DELTA) POPLAR GROVE 12 MI 17'30" CREEK Sandy Hook Kalmia Clark Chapel Gibson



HA- 1982 Forge Hill Road Bridge Harford Co Md Christopler Weeks Harford Co. Dept. of Public works Jan. 2000 looking weitheast 1 0



HA-1982 Forge Hill Koal Brile Harfird County, My Chris Weeks Jan. 2000 Harfiel Co Dept Pille Works Looking North 2/6



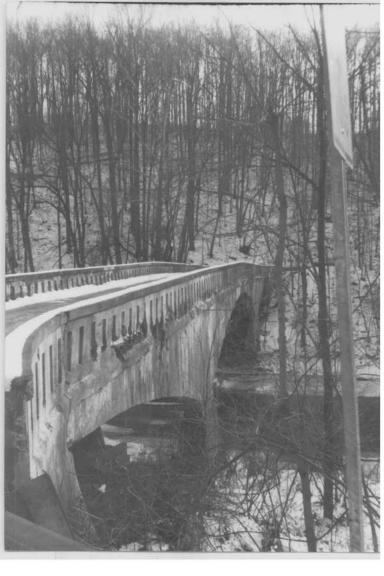
HA-1982 Purge Hill Road Bridge Harford County, My Chis Works Jan 2000 Harful Co Dont. P. Stiz Works east side of brile 3)6



HA 1982 Furge Hill Road Bridge Harfard (a M) Chris Weeks Jan. 2000 Harford Co Dopt. Poble Works Parapet dotal (dotor rection) 4/6



HA-1982 Furge Hill Road Broge Harford Co. M) Chris Works Jan. 2000 Harfiel Co Dept. Poblic works 5/6



HA-1982 Forge HAI Road Bridge Harford Co MD Chris Weeks Jan. 2000 Harfris Co. Dent Phic works looking south 6/6