MHT HO-~~78~~ 81

4

Form 10-300
(July 1969)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY – NOMINATION FORM

(Type all entries – complete applicable sections)

STATE: Maryland
COUNTY: Howard
FOR NPS USE ONLY
ENTRY NUMBER | DATE

SEE INSTRUCTIONS

1. NAME

COMMON: Bollman Truss Bollman Suspension Truss Bridge
AND/OR HISTORIC: Bollman Railroad Truss

2. LOCATION

STREET AND NUMBER: Gorman Road and Savage Road, Little Patuxent River
CITY OR TOWN: Savage
STATE: Maryland | CODE: 24 | COUNTY: Howard | CODE: 027

3. CLASSIFICATION

CATEGORY (Check One)	OWNERSHIP		STATUS	ACCESSIBLE TO THE PUBLIC
☐ District ☐ Building ☐ Site ☒ Structure ☐ Object	☒ Public ☐ Private ☐ Both	Public Acquisition: ☐ In Process ☐ Being Considered	☐ Occupied ☐ Unoccupied ☒ Preservation work in progress	Yes: ☐ Restricted ☒ Unrestricted ☐ No

PRESENT USE (Check One or More as Appropriate)

☐ Agricultural	☐ Government	☒ Park	☐ Transportation	☐ Comments
☐ Commercial	☐ Industrial	☐ Private Residence	☐ Other (Specify)	
☐ Educational	☐ Military	☐ Religious		
☐ Entertainment	☐ Museum	☐ Scientific		

4. OWNER OF PROPERTY

OWNER'S NAME: County Executive, Howard County, Howard County Courthouse
STREET AND NUMBER: 21043 Court Place
CITY OR TOWN: Ellicott City | STATE: Maryland | CODE: 24

STATE: Maryland

5. LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC.: Howard County Courthouse
STREET AND NUMBER: 21043 Court Place
CITY OR TOWN: Ellicott City | STATE: Maryland | CODE: 24

COUNTY: Howard

6. REPRESENTATION IN EXISTING SURVEYS (SEE CONTINUATION SHEET)

TITLE OF SURVEY: Maryland Register of historic sites and landmarks
DATE OF SURVEY: 1970 ☐ Federal ☒ State ☐ County ☐ Local
DEPOSITORY FOR SURVEY RECORDS: Maryland Historical Trust
STREET AND NUMBER: 94 College Avenue
CITY OR TOWN: Annapolis | STATE: Maryland | CODE: 24

FOR NPS USE ONLY
ENTRY NUMBER | DATE

7. DESCRIPTION

CONDITION	(Check One)					
	☐ Excellent	☒ Good	☐ Fair	☐ Deteriorated	☐ Ruins	☐ Unexposed
	(Check One)		(Check One)			
	☐ Altered	☒ Unaltered	☒ Moved	☐ Original Site		

DESCRIBE THE PRESENT AND ORIGINAL (if known) PHYSICAL APPEARANCE

On an abandoned Baltimore and Ohio Railroad spur in the village of Savage, Maryland, approximately three miles northeast of Laurel, halfway between Washington and Baltimore, is one of America's more significant civil engineering relics. This two-span iron truss bridge is the sole surviving example of a type that played a critical role in railroad development, a story that has characteristically been dominated by the parallel progress of the locomotive.

The 1850 structure, patented in 1852, was a small span of seventy-six feet and to some extent experimental. The design was undoubtedly inspired by the classical method of strengthening a wood beam by the addition of an iron truss rod below. The Bollman truss was invariably of composite construction: those members subjected to tensile stresses were of wrought iron; those in compression were of cheaper cast iron.

George K. Fitch in the Baltimore Engineer says:

> The idea of an all iron bridge was not original with Bollman. Such bridges were fairly common in England, the material at first being cast iron. The development of wrought iron and its use in combination with cast iron made a satisfactory structure but the idea failed to interest American designers principally because of the abundance of timber and the difficulty of obtaining sufficient quantities of usable iron.
>
> By 1850, manufacturing of iron products in America had overcome any shortage.
>
> The truss designed by Bollman was not in a true sense a truss. Rather it partook of the nature of a suspension bridge. It has been said that Latrobe, under whom Bollman worked, was skeptical of the prevalent trussing system in which the separate panel loads were accumulatively carried back to the end posts. In the Bollman design each panel load was individually carried back to the end of the bridge.
>
> Bollman adopted the familiar "king post" method of strengthening a beam by placing a short post underneath the beam at the center point and supporting the bottom end of the post by diagonal tension rods attached to the ends of the beam. This is exactly what Bollman did

(SEE CONTINUATION SHEET)

SEE INSTRUCTIONS

Form 10-300a
(July 1969)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY - NOMINATION FORM

(Continuation Sheet)

STATE	
Maryland	
COUNTY	
Howard	
FOR NPS USE ONLY	
ENTRY NUMBER	DATE

(Number all entries)

Bollman Truss

#6. REPRESENTATION IN EXISTING SURVEYS continued

National Historic Civil Engineering Landmark

1966 Federal

American Society of Civil Engineers
345 E. 47th Street
New York, New York code: 36

#7. DESCRIPTION continued

at each lower panel point of his truss. It should also be noted that the truss had no bottom chord and the downward stress in each vertical post was carried directly to the end posts by flat bars of wrought iron. In other words the vertical load in each post was suspended from the end posts.

This confusion of diagonal bracing gave the truss a spider-web looking elevation, but the theory was correct with one exception. Only the diagonals attached to the center post of the bridge were equal in length. All other diagonals had different lengths, which affected any distortion of material due to temperature changes causing unequal expansion in the diagonals making it difficult to keep the bridge in line.

Robert M. Vogel in an interview states in "Engineering Contributions of Wendel Alan Bollman":

A feature of the Bollman system was the independence of its structural units. Each floor beam was supported by two separate pairs of diagonal wrought-iron ("I") eye-bars or ties on each side of the bridge, so that if those carrying one beam should for any reason fail, the others would continue to carry their load undisturbed, preventing total collapse. Much was made of this point in an era when structural failures were not uncommon, and the spindly appearance of ironwork, contrasted with the familiar massiveness of works in timber

Form 10-300a
(July 1969)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY - NOMINATION FORM

(Continuation Sheet)

STATE	
Maryland	
COUNTY	
Howard	
FOR NPS USE ONLY	
ENTRY NUMBER	DATE

(Number all entries)

Bollman Truss

#7. DESCRIPTION continued

and masonry, was a source of some uncertainty to the traveling public.

#8. SIGNIFICANCE continued

In view of the primitive state of structural theory and practice with iron construction material at the time, plus the high cost and limited supply of the material, the proposal was an awesome one.

Gradually Bollman improved his truss bridge design which the Baltimore and Ohio used exclusively for cast iron railroad bridges until 1873 when heavier railroad trains demanded a different, more durable, structural material. Approximately one hundred Bollman-designed spans, erected either by the Baltimore and Ohio or by Bollman's company, the Patapsco Bridge and Iron Works, were constructed in the United States and in Latin America. As an example of the durability of the Bollman truss, the bridge over the Potomac at Harper's Ferry--where Bollman's cast iron trusses gradually replaced the wooden bridge (1852 to 1870)--served the Baltimore and Ohio and, later, highway traffic until destroyed by a flood in 1936.

The commitment of the Baltimore and Ohio Railroad to the Bollman truss is significant in that this decision helped reduce world suspicion about cast iron for bridge construction. The Baltimore and Ohio's confidence in cast iron induced many people in America and abroad to experiment with this then-revolutionary material.

Wendel Bollman was born in Baltimore in 1814. His connection with the Baltimore and Ohio Railroad Company began on July 4, 1828 (aged 14): Bollman, before he was eighteen years old, was present when Charles Carroll of Carrollton (1737-1832) turned the first spade of earth beginning the construction of the Baltimore and Ohio Railroad. For the next two years Bollman worked as a carpenter's apprentice laying track for the Baltimore and Ohio. From 1830 to 1837 Bollman studied carpentry and became a journeyman. In 1838, while working on a house in Harper's Ferry, Bollman was asked to help repair the wooden Baltimore and Ohio Railroad bridge over the Potomac. After completing the repairs Bollman was given a permanent job at age twenty-two with the Baltimore

8. SIGNIFICANCE

PERIOD *(Check One or More as Appropriate)*

☐ Pre-Columbian	☐ 16th Century	☐ 18th Century	☐ 20th Century
☐ 15th Century	☐ 17th Century	☒ 19th Century	

SPECIFIC DATE(S) *(If Applicable and Known)* 1869

AREAS OF SIGNIFICANCE *(Check One or More as Appropriate)*

Aboriginal	☐ Education	☐ Political	☐ Urban Planning
☐ Prehistoric	☒ Engineering	☐ Religion/Philosophy	☒ Other *(Specify)* Bridge construction Iron technology
☐ Historic	☐ Industry		
☐ Agriculture	☐ Invention	☐ Science	
☐ Architecture	☐ Landscape Architecture	☐ Sculpture	
☐ Art		☐ Social/Humanitarian	
☐ Commerce	☐ Literature		
☐ Communications	☐ Military	☐ Theater	
☐ Conservation	☐ Music	☒ Transportation	

STATEMENT OF SIGNIFICANCE

The Bollman bridge at Savage, Maryland, is the sole surviving Bollman truss in the United States, and possibly in the world.

The system of bridge trussing invented by the Baltimore engineer Wendel Bollman (1814-1884) was the first to be used with consistency on an American railroad in which all of the principal structural members were of iron.

The direct and intimate relationship of this bridge to two present National Historic Landmarks should be noted. The Thomas Viaduct, Howard and Baltimore Counties, and the Baltimore and Ohio Transportation Museum, Baltimore City, have been so designated as fitting recognition of the vital role played by the Baltimore and Ohio Railroad in America's internal communication and transportation. The Bollman truss, it can be fairly stated, played as vital a role in the railroad's development as did any other single aspect of its early plant.

The Bollman truss bridge at Savage is the only structure in Maryland designated as a National Historic Civil Engineering Landmark (1966) by the American Society of Civil Engineers.

Bollman, serving under Benjamin H. Latrobe as "Master of Road" for the Baltimore and Ohio Railroad, gave form to the concept with what he termed a "suspension" truss.

From its inception, as the first commercially organized railroad in the United States, the Baltimore and Ohio was a pioneer venture. Its innovations in railway construction, motive power and structural engineering, influenced and led the thinking of railroads around the world. No single departure was more crucial than the decision of Benjamin H. Latrobe, the Railroad's Chief Engineer, in about 1848, to substitute iron for timber in all major bridges along the line, both old and new, to eliminate fire hazard, rot and the other defects and hazards inherent in timber construction.

(SEE CONTINUATION SHEET)

SEE INSTRUCTIONS

Form 10-300a
(July 1969)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY - NOMINATION FORM

(Continuation Sheet)

STATE	
Maryland	
COUNTY	
Howard	
FOR NPS USE ONLY	
ENTRY NUMBER	DATE

(Number all entries)

Bollman Truss

#8. SIGNIFICANCE continued

and Ohio as foreman of the bridge construction. Through self education and native ability, Bollman worked himself up to assistant, working as bridge designer for the Chief Engineer, Benjamin H. Latrobe. In 1848 Bollman was made "Master of the Road" for the Baltimore and Ohio Railroad Company which put him in charge of all construction. During his service in this position the Baltimore and Ohio completed the arduous continuation of the railroad across the mountains to the Ohio River.

His contribution to engineering is the design of more than one hundred bridges, erected by the Baltimore and Ohio Railroad Company before 1880. More significant at the time, however, were the advances Bollman made in structural theory: the rods on the Bollman truss were forerunners, in theory, to the cables used in suspension bridges. Bollman's iron columns for a bridge in Havana, Cuba, provided the inspiration for the rolled-iron columns, known as the "Phoenix" form which circumvented the brittle qualities of wrought iron. Bollman's name is not as familiar as that of John Augustus Roebling, designer of the Brooklyn Bridge, however, his influence in the development of iron bridges is equal to Roebling's.

In 1858 Bollman left the Baltimore and Ohio Company to form his own bridge building company. The Baltimore and Ohio Company continued to use Bollman's trusses and his services. In 1864 he designed the Y-shaped Harper's Ferry Bridge, which remained in good working order continuously through 1894. Bollman, working through a company of his own, designed bridges in Iowa, over the Mississippi, in Ohio, over the Ohio River, and in North Carolina, over the Cape Fear River. Bollman's skills were also in demand in Chile, Mexico, and Cuba. In his native city--Baltimore--Bollman designed a dozen bridges, including the water pipe truss over Jones Falls stream, at Lombard Street; the cast iron framework for the dome, as well as the cast iron stairs, of the City Hall, Baltimore (designed in 1873 by George A. Frederick).

The present (1971) Savage bridge was built in 1869 on the main line. As locomotive and train weight increased it became inadequate for this service and in 1888 the 1869 Savage bridge was removed to its present location on the Savage spur.

9. MAJOR BIBLIOGRAPHICAL REFERENCES

Recorders: Michael Bourne, Maryland Historical Trust, Annapolis, Maryland, 1968; Nancy Miller, Historian, Maryland Historical Trust, 1969.

Biographical Cyclopedia of Representative Men of Maryland and the District of Columbia. Baltimore: National Biographical Publishing, 1879.

(SEE CONTINUATION SHEET)

10. GEOGRAPHICAL DATA

LATITUDE AND LONGITUDE COORDINATES DEFINING A RECTANGLE LOCATING THE PROPERTY							OR	LATITUDE AND LONGITUDE COORDINATES DEFINING THE CENTER POINT OF A PROPERTY OF LESS THAN TEN ACRES					
CORNER	LATITUDE			LONGITUDE				LATITUDE			LONGITUDE		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds		Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
NW	°	'	"	°	'	"		39°	06'	55.5"	76°	49'	31.0"
NE	°	'	"	°	'	"							
SE	°	'	"	°	'	"							
SW	°	'	"	°	'	"							

APPROXIMATE ACREAGE OF NOMINATED PROPERTY: 4 acres (SEE CONTINUATION SHEET)

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE:	CODE	COUNTY	CODE
STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE

11. FORM PREPARED BY

NAME AND TITLE:
Mrs. Preston Parish, Keeper of the Maryland Register

ORGANIZATION
Maryland Historical Trust

DATE
Dec.22, 1971

STREET AND NUMBER:
94 College Avenue

CITY OR TOWN:
Annapolis

STATE
Maryland

CODE
24

12. STATE LIAISON OFFICER CERTIFICATION

As the designated State Liaison Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service. The recommended level of significance of this nomination is:

National ☐ State ☒ Local ☐

Name Orlando Ridout, IV
Orlando Ridout IV

Title State Liaison Officer for Maryland

Date December 23, 1971

NATIONAL REGISTER VERIFICATION

I hereby certify that this property is included in the National Register.

Chief, Office of Archeology and Historic Preservation

Date

ATTEST:

Keeper of The National Register

Date

SEE INSTRUCTIONS

Form 10-300a
(July 1969)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY - NOMINATION FORM

(Continuation Sheet)

STATE	
Maryland	
COUNTY	
Howard	
FOR NPS USE ONLY	
ENTRY NUMBER	DATE

(Number all entries)

Bollman Truss

#9. REFERENCES continued

Edwards, Lewellyn Nathaniel. A Record of History and Evolution of Early American Bridges. Orono, Maine: Maine University Press, 1959.

Fitch, George K. "Wendel Bollman . . . and His Times." Baltimore Engineer. Vol. XLI (November 1966), 5-6, 12.

Hungerford, Edward. The Story of the Baltimore and Ohio Railroad 1827-1927. 2 vols. New York: G. P. Putnam's Sons, 1928.

Stover, John F. American Railroads. Chicago: University of Chicago Press, 1961.

Vogel, Robert M., Jr. "Engineering Contributions of Wendel Alan Bollman." Paper #36. U. S. National Museum Bulletin #240. Washington, D. C., 1964.

#10. GEOGRAPHICAL DATA continued

This bridge, as a significant engineering monument, would require a protective area of four acres to assure that incompatible encroachments do not intrude upon the location.

~~1400810517~~ 40-28

1400810517 81

See # 40-26

BOLLMAN TRUCK

Dat... ex

81

Form 10-445
(5/62)

1. STATE Maryland
COUNTY Howard
TOWN Savage VICINITY
STREET NO.

ORIGINAL OWNER Baltimore & Ohio R.R.
ORIGINAL USE bridge for main line of railroad
PRESENT OWNER Baltimore & Ohio R.R.
PRESENT USE unused
WALL CONSTRUCTION cast iron
NO. OF STORIES

HISTORIC AMERICAN BUILDINGS SURVEY
INVENTORY HC- 81

2. NAME Bollman Truss

DATE OR PERIOD 1869
STYLE Bollman Truss
ARCHITECT
BUILDER

3. FOR LIBRARY OF CONGRESS USE

4. NOTABLE FEATURES, HISTORICAL SIGNIFICANCE AND DESCRIPTION OPEN TO PUBLIC yes

This is the last surviving example of the more than one hundred such trusses constructed of cast iron members and composed of two spans of eighty feet each, equalling 100 feet. It was moved from an unknown position to its present location, in 1888, along the main line of the Baltimore and Ohio Railroad and carried an industrial spur over the Little Patuxent River. It was last actively used in 1906.

5. PHYSICAL CONDITION OF STRUCTURE Endangered no Interior Exterior good

6. LOCATION MAP (Plan Optional)

7. PHOTOGRAPH

8. PUBLISHED SOURCES (Author, Title, Pages)
INTERVIEWS, RECORDS, PHOTOS, ETC.
Engineering Contributions of Wendel Alan Bollman, Robert M. Vogel, Jr., paper # 30, U.S. National Museum Bulletin, #240 Washington 1964

9. NAME, ADDRESS AND TITLE OF RECORDER
Michael Bourne
Maryland Historical Trust

DATE OF RECORD June, 20, 1968

SUPPLEMENTAL INFORMATION AND PHOTOGRAPHS MAY BE ADDED ON SHEET OF SAME SIZE

Form 10-445
(5/62)

1. STATE Maryland
COUNTY Howard
TOWN Savage VICINITY
STREET NO.

ORIGINAL OWNER Baltimore & Ohio R.R.
ORIGINAL USE bridge for main line of railroad
PRESENT OWNER Baltimore & Ohio R.R.
PRESENT USE unused
WALL CONSTRUCTION cast iron
NO. OF STORIES

HISTORIC AMERICAN BUILDINGS SURVEY
INVENTORY HO-78

2. NAME Bollman Iron Truss Bridge

DATE OR PERIOD 1869
STYLE Bollman Truss
ARCHITECT
BUILDER

3. FOR LIBRARY OF CONGRESS USE

4. NOTABLE FEATURES, HISTORICAL SIGNIFICANCE AND DESCRIPTION OPEN TO PUBLIC YES

This is the last surviving example of the more than one hundred such trusses constructed of cast iron members and composed of two spans of eighty feet each, equalling 160 feet. It was moved from an unknown position to its present location, in 1888, along the main line of the Baltimore and Ohio Railroad and carried an industrial spur over the Little Patuxent River. It was last actively used in 1966.

5. PHYSICAL CONDITION OF STRUCTURE Endangered NO Interior Exterior GOOD

6. LOCATION MAP (Plan Optional)

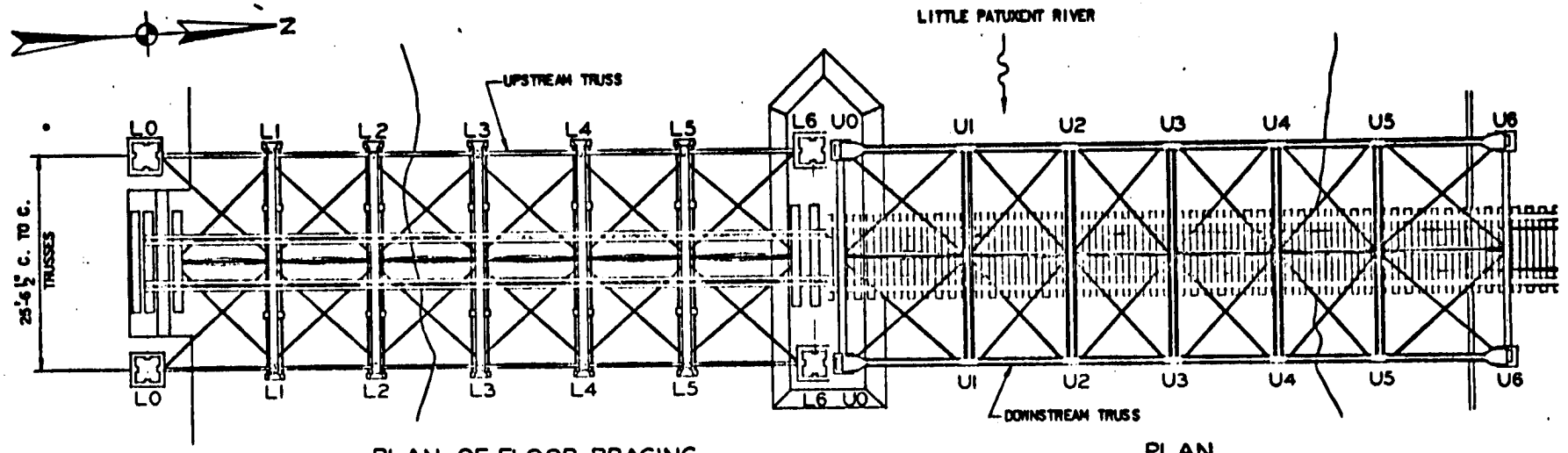
7. PHOTOGRAPH

8. PUBLISHED SOURCES (Author, Title, Pages)
INTERVIEWS, RECORDS, PHOTOS, ETC.
Engineering Contributions of Wendel Alan Bollman, Robert M. Vogel, Jr., paper #36, U.S. National Museum Bulletin, #240 Washington 1964

9. NAME, ADDRESS AND TITLE OF RECORDER
Michael Bourne
MD. HISTORICAL TRUST
BOX 1704
ANNAPOLIS, MD. 21404

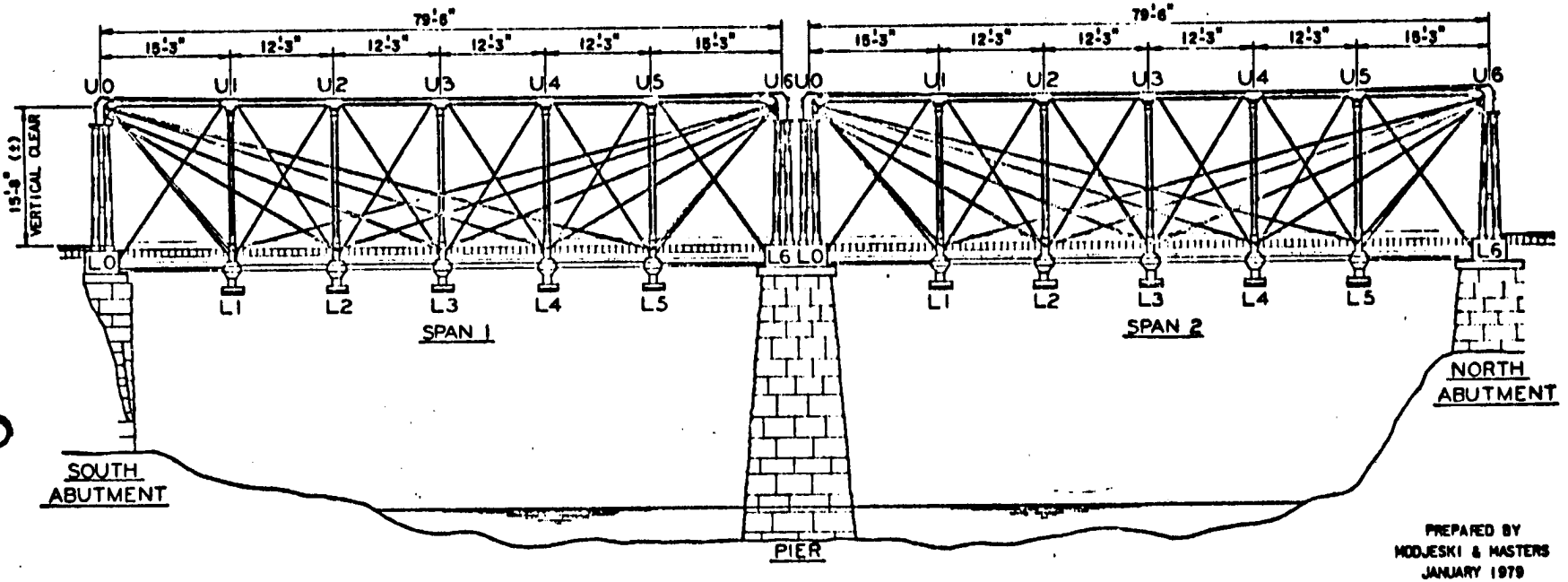
DATE OF RECORD June 20, 1968

SUPPLEMENTAL INFORMATION AND PHOTOGRAPHS MAY BE ADDED ON SHEET OF SAME SIZE



PLAN OF FLOOR BRACING

PLAN



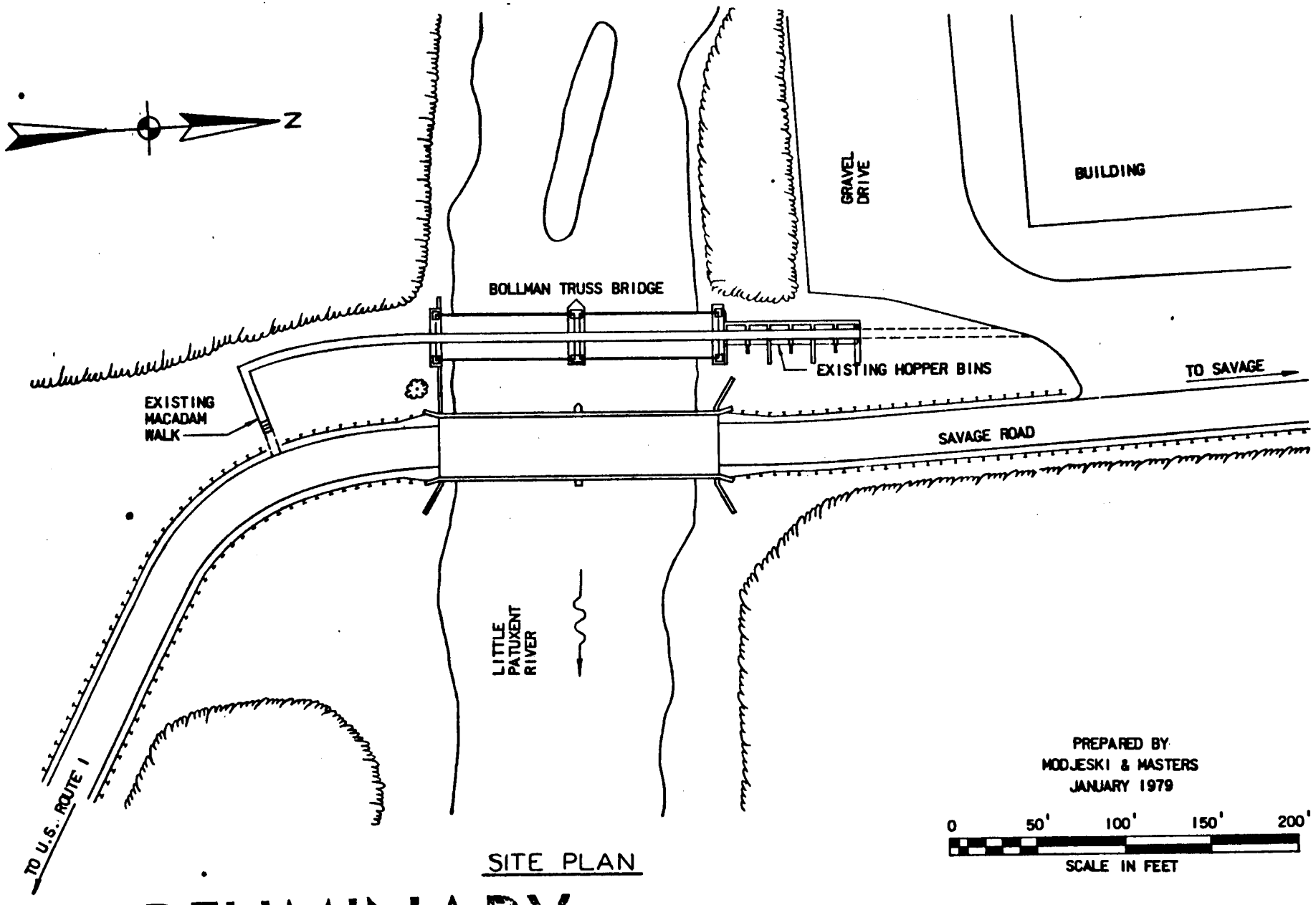
ELEVATION

PREPARED BY
MODJESKI & MASTERS
JANUARY 1979

0 5' 10' 20' 30' 40'
SCALE IN FEET

HO-81

PRELIMINARY



SITE PLAN

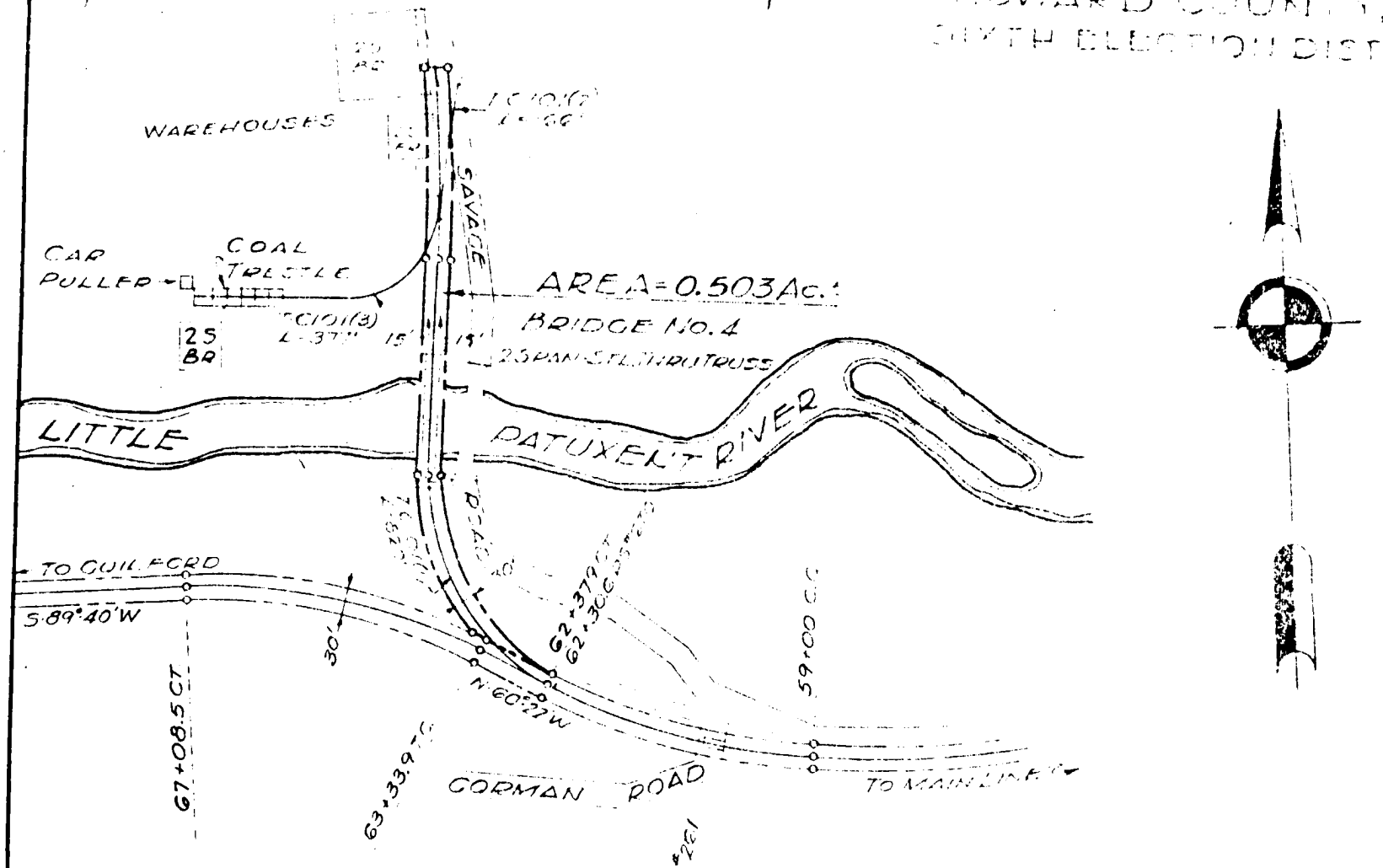
PREPARED BY
MODJESKI & MASTERS
JANUARY 1979

0 50' 100' 150' 200'
SCALE IN FEET

PRELIMINARY

H0-81

HOWARD COUNTY, MD.
SIXTH ELECTION DIST.



THE BALTIMORE AND OHIO RAILROAD COMPANY
BALTIMORE DIV PATUXENT BR

PROPERTY TO BE CONVEYED TO HOWARD COUNTY PARK

SAVAGE, MD.

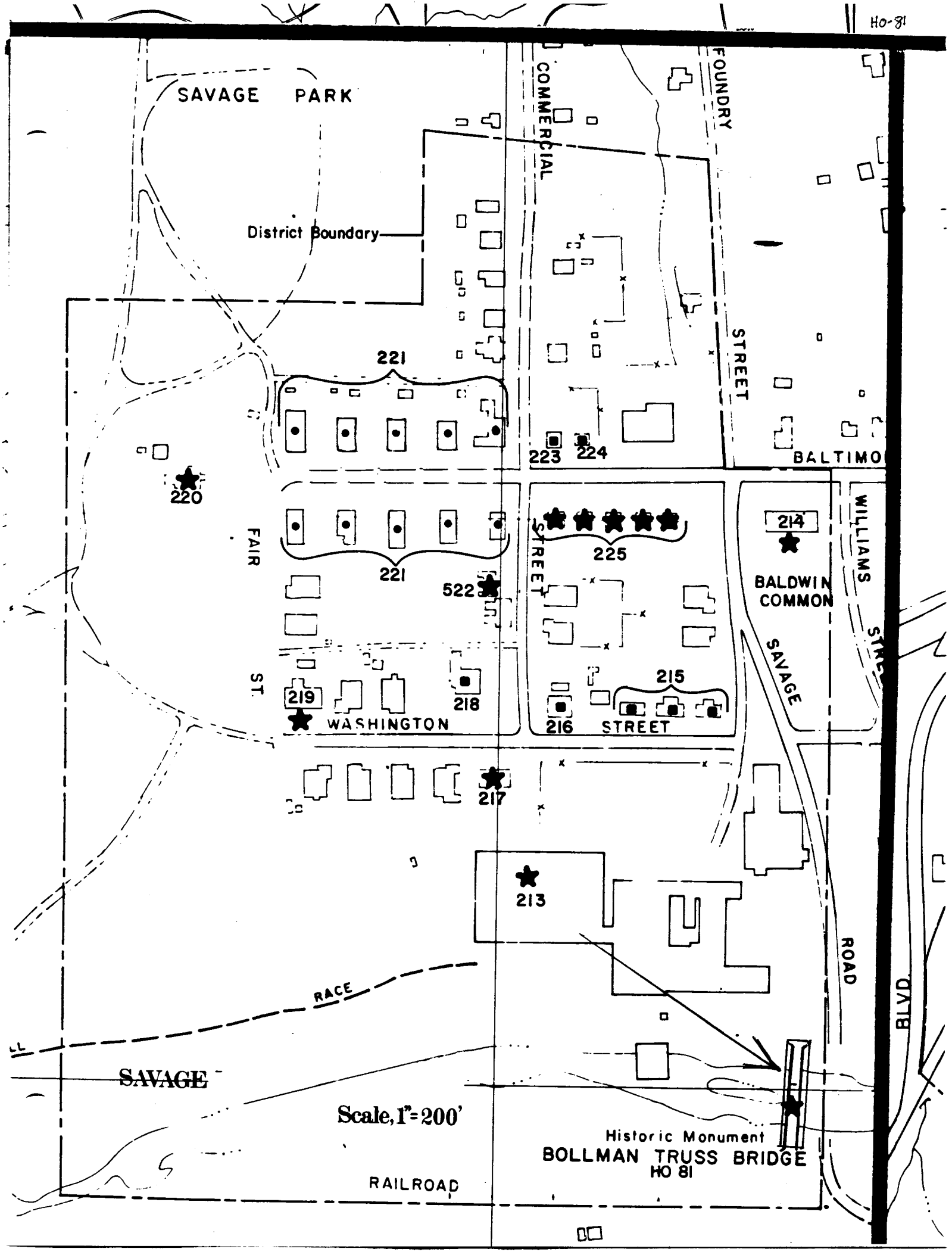
Scale=1"=200' May 27, 1966.

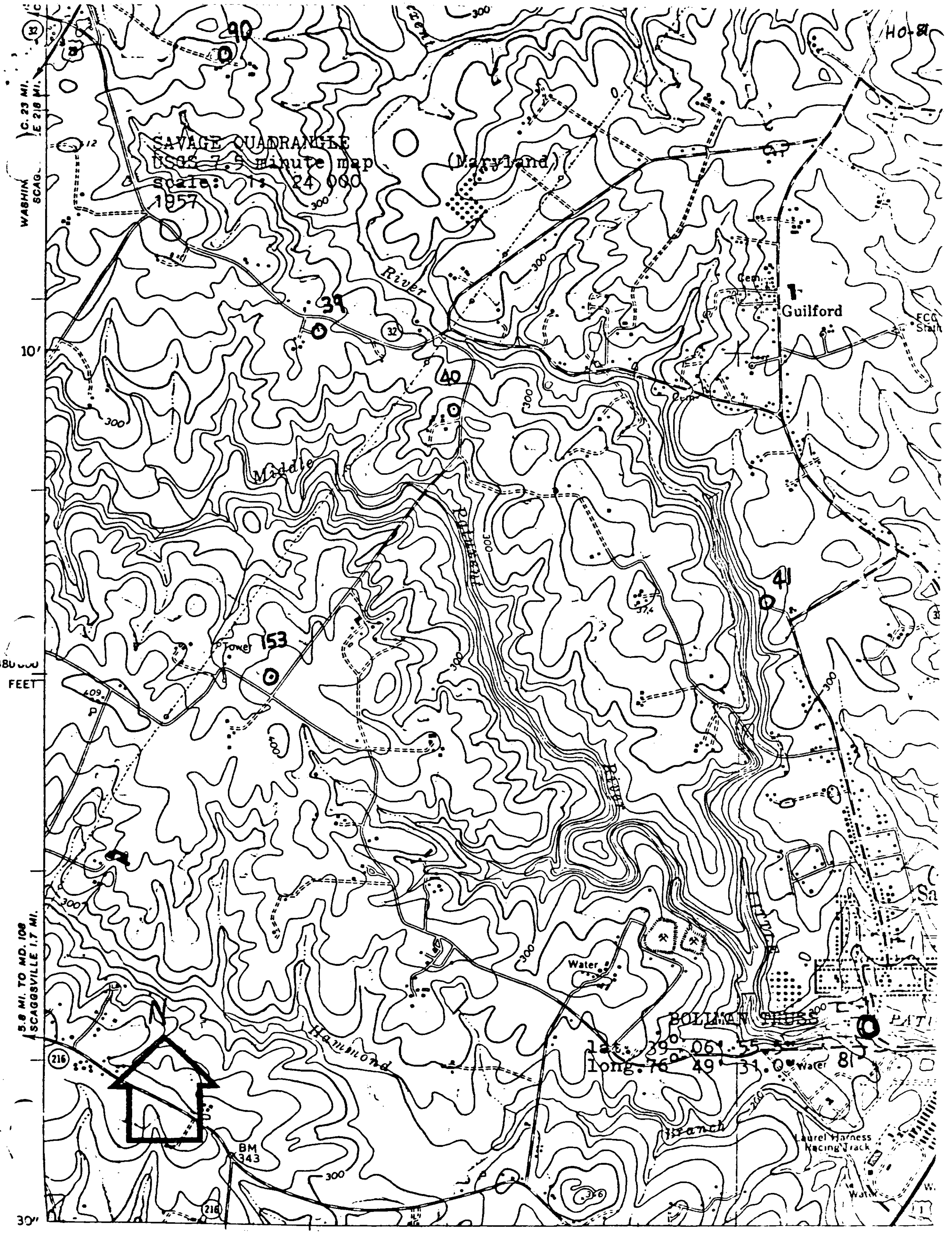
Office of Chief Engineer
Baltimore, Md.

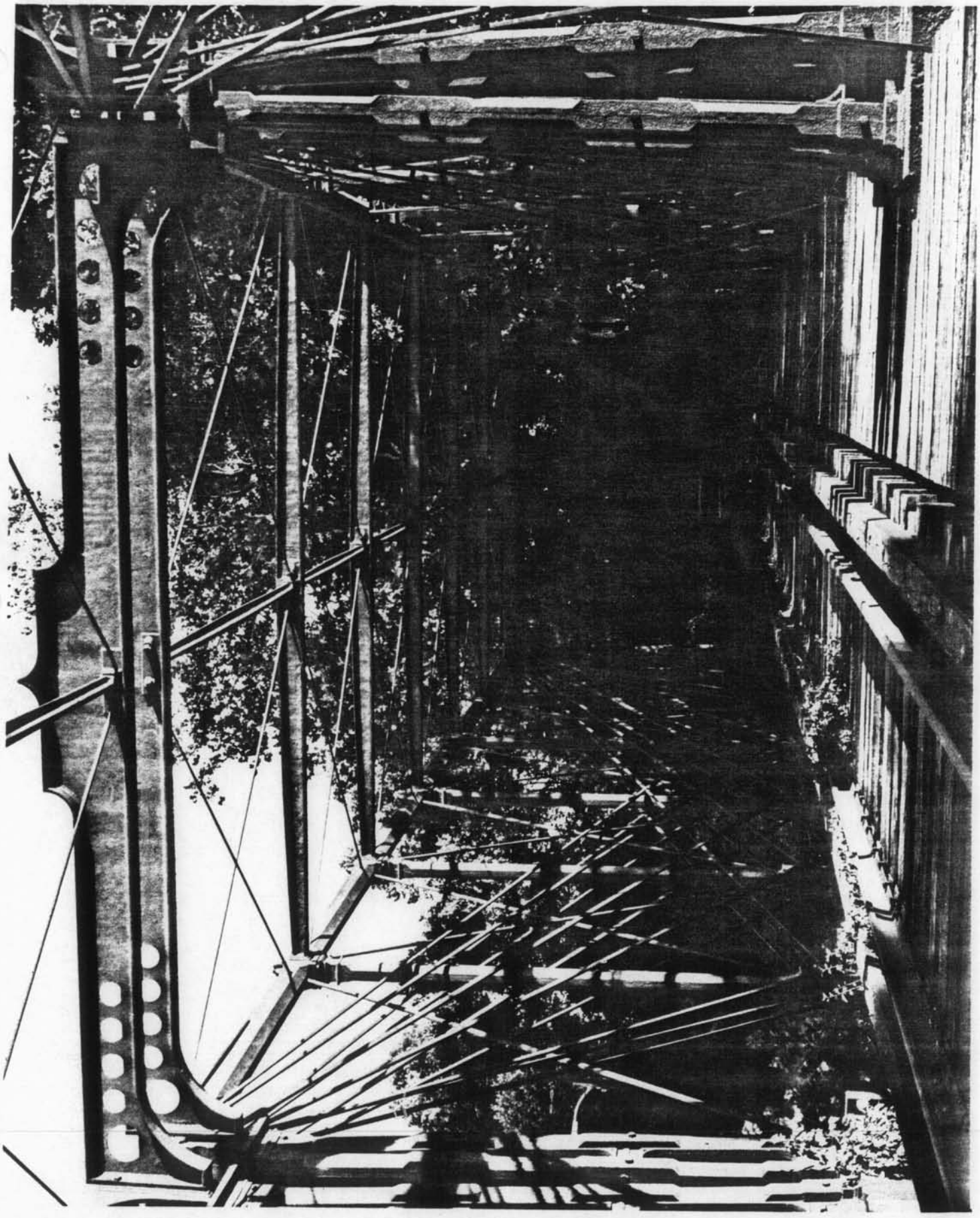
Dwg. No. 39129

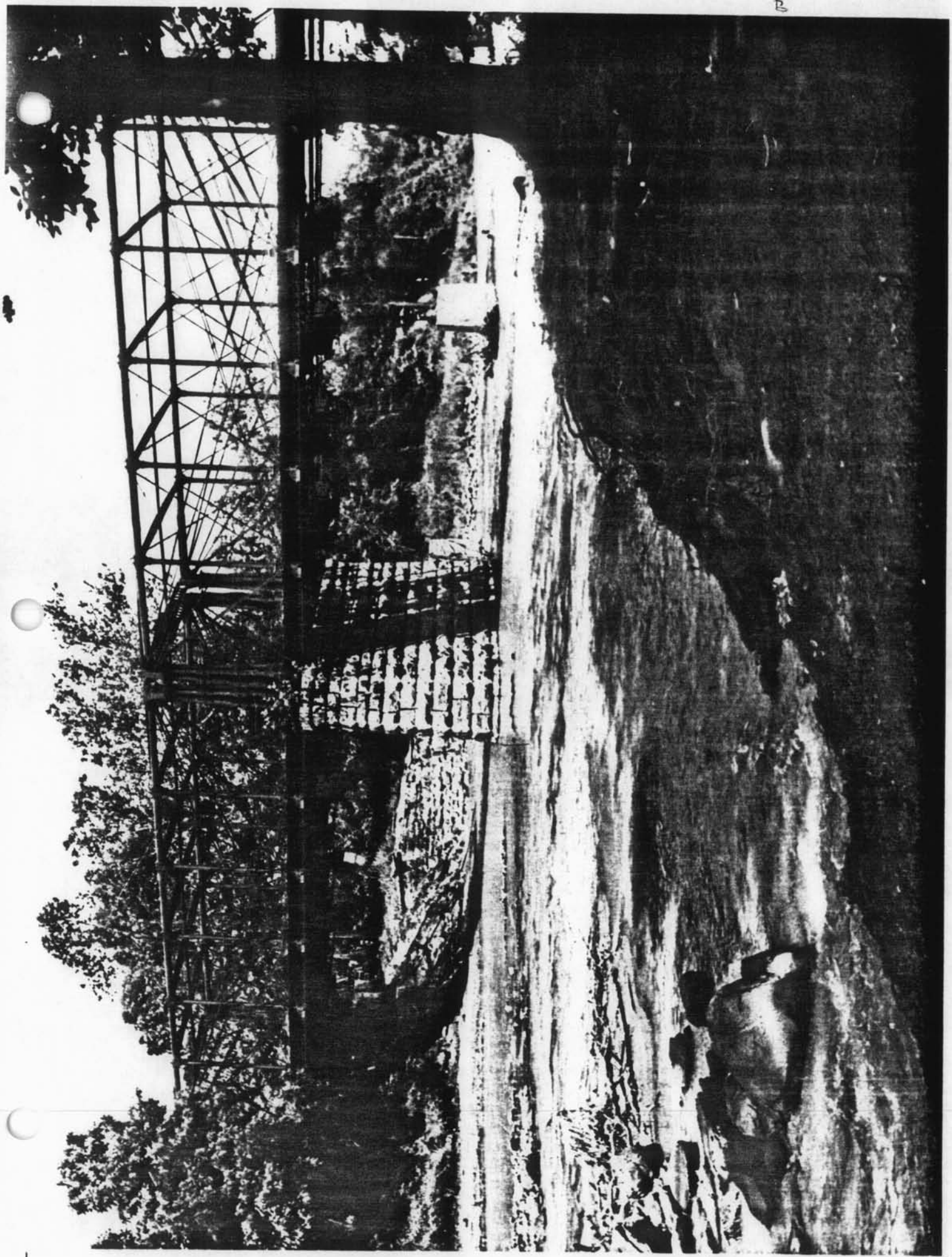
18.2
1

HO-81


SAVAGE PARK
COMMERCIAL
FOUNDRY
STREET
District Boundary
221
223
224
BALTIMO
220
FAIR
ST.
221
522
STREET
225
214
BALDWIN
COMMON
WILLIAMS
SAVAGE
219
WASHINGTON
218
215
216
STREET
217
213
ROAD
BLVD.
RACE
SAVAGE
Scale, 1"=200'
Historic Monument
BOLLMAN TRUSS BRIDGE
HO 81
RAILROAD


SAVAGE QUADRANGLE
USGS 7.5 minute map (Maryland)
scale: 1: 24 000
1957
90
39
40
41
153
81
Guilford
River
Middle
Run
Hammond
Branch
Tower
Water
Cem
BOLLMAN TRUSS
lat. 39° 06' 55.5"
long. 76° 49' 31.0"
Laurel Harness Racing Track
BM 343
N
5.8 MI. TO MD. 108
SCAGGSVILLE 1.7 MI.
10'
FEET
30'





~~1400810517~~ HO-~~28~~

1400810517 81

See # HO-26

BOLLMAN TRUSS

National Register

81 ~~#~~

Bollman Trussed Bridge - HD-8

Jean Ewing
12/1972

Neg. on file @ MHT

HD-81

Bollman Truss Bridge

Jean Ewing

12/1972

Neg. on File at HHT

Negative @ MIT

HO. 81

Savage

Bollman

(Savage Iron) Truss Bridge

11/72

HO.81

Savage

Bollman

Savage Iron Truss Bridge

83 11/72

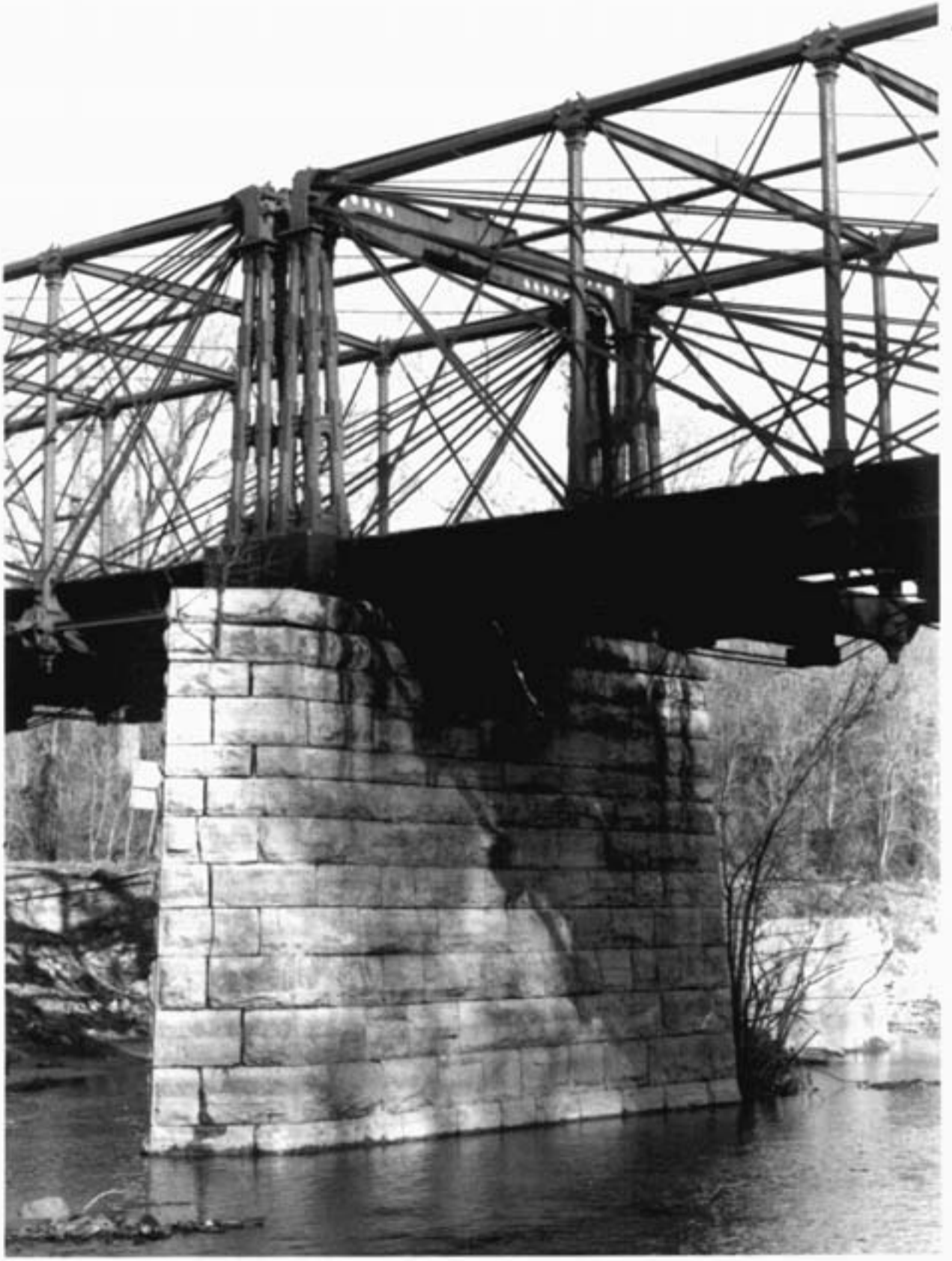
110-51

Bollman Truss Bridge

Jean Cuming

12/1972

Neg. on file @ MHT



HO-81
Bollman Truss Bridge
Jean Ewing
12/1972
Neg. on file at HAER

HO-81
Ballman Truss Bridge
Jean Ewing
12/1972
Neg. on file @ MHT

Kodak
paper & equipment used
to produce this picture

APR 1983

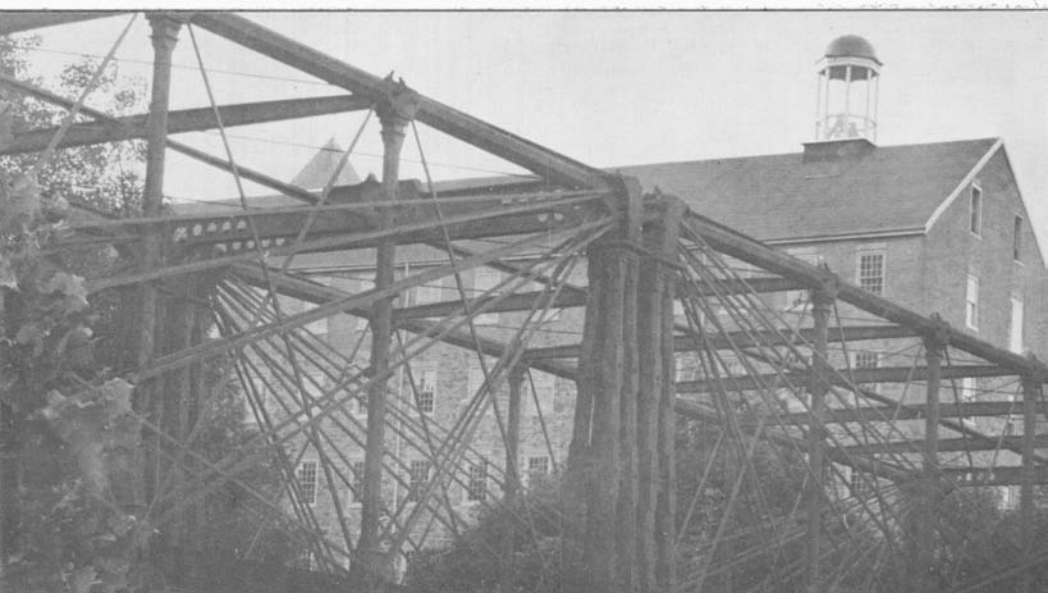
Kodak
paper & equipment used
to produce this picture

APR 1983

Kodak
paper & equipment u
to produce this pictu

APR 1983

12-OH



The Savage cotton duck mill, restored in 1966, was founded in 1816. Near it stands a Bollman truss bridge, only surviving structure of its kind.

HO-81

Rollman truss bridge, Savage, Md. 1869
(behind) Savage cotton duck mill 1816

(1956 photo)

HL-81

RWVogel