**Maryland Historical Trust**

Maryland Inventory of Historic Properties number: WO-491

Name: US 13 SOUTHBOUND OVER WAGRAM CRK.

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 bridge received the following determination of eligibility.

**MARYLAND HISTORICAL TRUST**

Eligibility Recommended ___X___ Eligibility Not Recommended _____

Criteria: ____A ____B ___X___C ____D Considerations: ___A ___B ___C ___D ___E ___F ___G __None

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**

**MHT No.** WO-491

**SHA Bridge No.** 23005 **Bridge name** U.S. 13 Southbound over Wagram Creek

**LOCATION:**
**Street/Road name and number [facility carried]** U.S. 13 Southbound

**City/town** Pocomoke City **Vicinity** X

**County** Worcester

**This bridge projects over: Road**____ **Railway**_____ **Water** X **Land** ____

**Ownership: State** X **County** _____ **Municipal** _____ **Other** _____

**HISTORIC STATUS:**
**Is the bridge located within a designated historic district? Yes** _____ **No** X
**National Register-listed district** ____ **National Register-determined-eligible district** __
**Locally-designated district** _____ **Other** _____

**Name of district** _____

**BRIDGE TYPE:**
**Timber Bridge** X :
**Beam Bridge** _____ **Truss -Covered** ___ **Trestle** ____ **Timber-And-Concrete** X

**Stone Arch Bridge** _____

**Metal Truss Bridge** _____

**Movable Bridge** ____:
**Swing** _____ **Bascule Single Leaf** __ **Bascule Multiple Leaf** _____
**Vertical Lift** _____ **Retractile**_____ **Pontoon** _____

**Metal Girder**_____:
**Rolled Girder** _____ **Rolled Girder Concrete Encased** _____
**Plate Girder** _____ **Plate Girder Concrete Encased** _____

**Metal Suspension** _____

**Metal Arch** _____

**Metal Cantilever** _____

**Concrete** _____:
**Concrete Arch**_____ **Concrete Slab** ____ **Concrete Beam** ____ **Rigid Frame** _____
**Other** _____ **Type Name** _____

**DESCRIPTION:**

**Setting: Urban** _____ **Small town** _____ **Rural** ____X____

**Describe Setting:**

Bridge No. 23005 carries U.S. 13 Southbound over Wagram Creek in Worcester County. U.S. 13 Southbound runs north-south and Wagram Creek flows east-west. The bridge is located south of Pocomoke City, approximately .8 kilometers (.5 miles) north of the Virginia State line and is surrounded by wooded wetlands.

**Describe Superstructure and Substructure:**

Bridge No. 23005 is a 4-span, 2-lane, composite timber and concrete bridge. The bridge was built in 1945 and is currently used to carry vehicular traffic southbound on U.S. 13. A separate bridge structure was constructed in 1954 to carry northbound vehicular traffic. The structure is 25.6 meters (84 feet) long and has a clear roadway width of 8.5 meters (28 feet); there are two sidewalks; the sidewalk on the west is .9 meters (3 feet) wide and the sidewalk on the east is .6 meters (2 feet) wide. The out-to-out width is 10.9 meters (36 feet). The superstructure consists of the timber slab, timber stringers with bituminous concrete deck overlay. The structure has concrete railings with decorative concrete end blocks and the roadway approaches have w-beam guardrails. The substructure consists of two timber abutments and three timber bents at mid-length. There are no wing walls. The bridge is posted for maximum legal loads and has a sufficiency rating of 73.4.

According to the 1996 inspection report, this structure was in good condition with minor splitting and checking at knots. Stringers are soft on the surface to a depth of 1.3 centimeters (.5 inches) ±, then become solid. The asphalt wearing surface has no pot holes or patches. The timber substructure and concrete railings are in good condition.

**Discuss Major Alterations:**

There have been no major alterations to this structure.

**HISTORY:**

**WHEN was the bridge built:** 1945
**This date is: Actual** ____X____ **Estimated** _____
**Source of date: Plaque** ____ **Design plans** ___ **SHA bridge files/inspection form** ___X___
**Other (specify):**

**WHY was the bridge built?**

The bridge was constructed in response to the need for more efficient transportation network and increased load capacity.

**WHO was the designer?**

State Roads Commission

**WHO was the builder?**

Unknown

**WHY was the bridge altered?**

N/A

**Was this bridge built as part of an organized bridge-building campaign?**

There is no evidence that the bridge was built as part of an organized bridge building campaign.

**SURVEYOR/HISTORIAN ANALYSIS:**

**This bridge may have National Register significance for its association with:**
**A - Events _____ B- Person _____**
**C- Engineering/architectural character ____X____**

The bridge is eligible for the National Register of Historic Places under Criterion C, as a significant example of composite timber and concrete construction. The structure has a high degree of integrity and retains such character-defining elements of the type as the composite timber slab, timber piers, timber bents and concrete railing.

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

The earliest bridges built in North America were timber bridges. According to one account, European settlers at first utilized the bridges constructed by the Native American populations, which consisted of tied timbers laid across up-turned forked tree trunks (American Association of State Highway Officials 1953: 19). This design was adopted by the settlers, who then modified the design by hewing the upper portions of the timbers to provide a flat surface and by adding a handrail to one side (American Society of Civil Engineers 1976: 143). Where crossings exceeded the length of the available timber, short spans were joined and supported on wood piles or on timber cribs filled with earth or stone. In fact, the earliest recorded bridge built by European settlers in America was most likely this type of design. Constructed in 1611 on James Towne Island, Virginia, this timber bridge extended approximately 200 feet into the water and provided docking facilities in the 12 foot deep channel (American Association of State Highway Officials 1953: 19).

The combination of timber with other materials began with the invention of the Howe truss in 1840. William Howe patented a truss which utilized iron verticals as tension members and wood diagonals as compression members. The Howe truss became a standard of railroad bridge design. By the 1860s, the problem of wood deterioration was under better control with the invention of pressure creosote treatments, which extended the life of the wood members. Timber pile bent structures remained popular, in particular in tidal areas, into the twentieth century. These were most often used in combination with concrete.

Timber bridges continued to be constructed in the United States during the twentieth century. A significant technological development of the 1930s permitted construction of timber-concrete composite structures, featuring decks utilizing both timber and reinforced concrete. The 1975 American Society of Civil Engineers Design Guide and Commentary on Wood Structures offered the following description of composite decks of timber and concrete:

> Composite timber-concrete decks are commonly used in bridge construction. Construction is such that timber carries most of the tension forces. Composite construction is of two basic types, T-beams and slab decks.... Composite T-beam sections consist of timber stringers, which form the stem, and concrete slab for the flange area. Notches are cut into the top edge

> of the stringers to resist horizontal shear and mechanical fasteners are driven into the top to prevent vertical separation so that the two components perform integrally. Stresses due to temperature changes must be considered in the concrete section.
>
> Composite slabs consist of nominal 2-inch lumber, usually nailed-laminated with the wide faces vertical, and a concrete section cast monolithically in place. Grooves are formed by using alternate laminations that differ in width by 2 inches or by fabricating panels with a 2-inch offset between laminations. Horizontal shear is resisted by grooves cut into the projecting laminations or by metal shear plates. Transverse joints in the timber portion are made by dapping or cutting alternate laminations to a different length to provide finger joints. The concrete slab should be reinforced for temperature stress and for negative bending stresses when the deck is continuous over a support. No falsework or extensive forming is necessary with this construction (American Society of Civil Engineers 1975:372-73).

The timber-concrete composite slab type of bridge construction was pioneered in the United States by James F. Seiler and the American Wood-Preservers Association between 1932 and 1935. The latter organization's 1935 patent for "composite wood and concrete construction" became the basis for such technology.

Such timber-and-concrete composite structures were evidently introduced in Maryland by the State Roads Commission engineers, who kept abreast of early twentieth century trends in composite bridge design. In the 1937-1938 *Report of the State Roads Commission*, Bridge Division Chief Engineer Walter C. Hopkins acknowledged professional interest in such structures:

> The bridges constructed have been varied, with miscellaneous types and of different materials. Bridges have been built of concrete, steel, timber, or stone, or combinations thereof. Careful study is given the employment of those materials most satisfactorily adapted to the structure in question. Balance, proportion and treatment that will result in simplicity, gracefulness and pleasing appearance are always considered and sought by the designer (State of Maryland, State Roads Commission 1938:71).

The Bridge Division's earliest timber-and-concrete composite bridges were built in 1937-1938 in Tidewater Maryland. Pictured in the 1937-1938 State Roads Commission report, the longest such bridge was "a timber and concrete composite bridge of twelve 20-foot spans, providing a clear roadway of 26 feet, and two 3-foot, 1-inch sidewalks, over Tony Tank Pond, on the road from Salisbury to Princess Anne near Salisbury, Wicomico County" (State of Maryland, State Roads Commission 1938:83).

Subsequent State Roads Commission reports refer to additional timber-concrete composite bridges constructed under state authority between 1939 and 1960, primarily at Tidewater (Coastal Plain) sites on the Eastern Shore and in Southern Maryland (State of Maryland, State Roads Commission 1939:71; 1943:45). In 1947, Bridge Division engineers observed that "the development of the composite use of timber and concrete has permitted the design of economical structures with the general appearance from the roadway of a much more costly bridge" (State of Maryland, State Roads Commission 1947:53).

**When the bridge was built and/or given a major alteration, did it have a significant impact on the growth and development of the area?**

There is no evidence that the construction of this bridge had a significant impact on the growth and development of this area.

**Is the bridge located in an area which may be eligible for historic designation and would the bridge add to or detract from the historic/visual character of the potential district?**

The bridge is located in an area which does not appear to be eligible for historic designation.

**Is the bridge a significant example of its type?**

The bridge is a potentially significant example of a composite timber and concrete bridge, possessing a high degree of integrity.

**Does the bridge retain integrity of important elements described in Context Addendum?**

The bridge retains the character-defining elements of its type, as defined by the Statewide Historic Bridge Context, including the composite timber slab, timber piers, bents and concrete railing.

**Is the bridge a significant example of the work of a manufacturer, designer, and/or engineer?**

This bridge is not a significant example of the work of a manufacturer, designer, and/or engineer.

**Should the bridge be given further study before an evaluation of its significance is made?**

No further study of this bridge is required to evaluate its significance.

**BIBLIOGRAPHY:**

**County inspection/bridge files** _____ **SHA inspection/bridge files** ___X___
**Other (list):**

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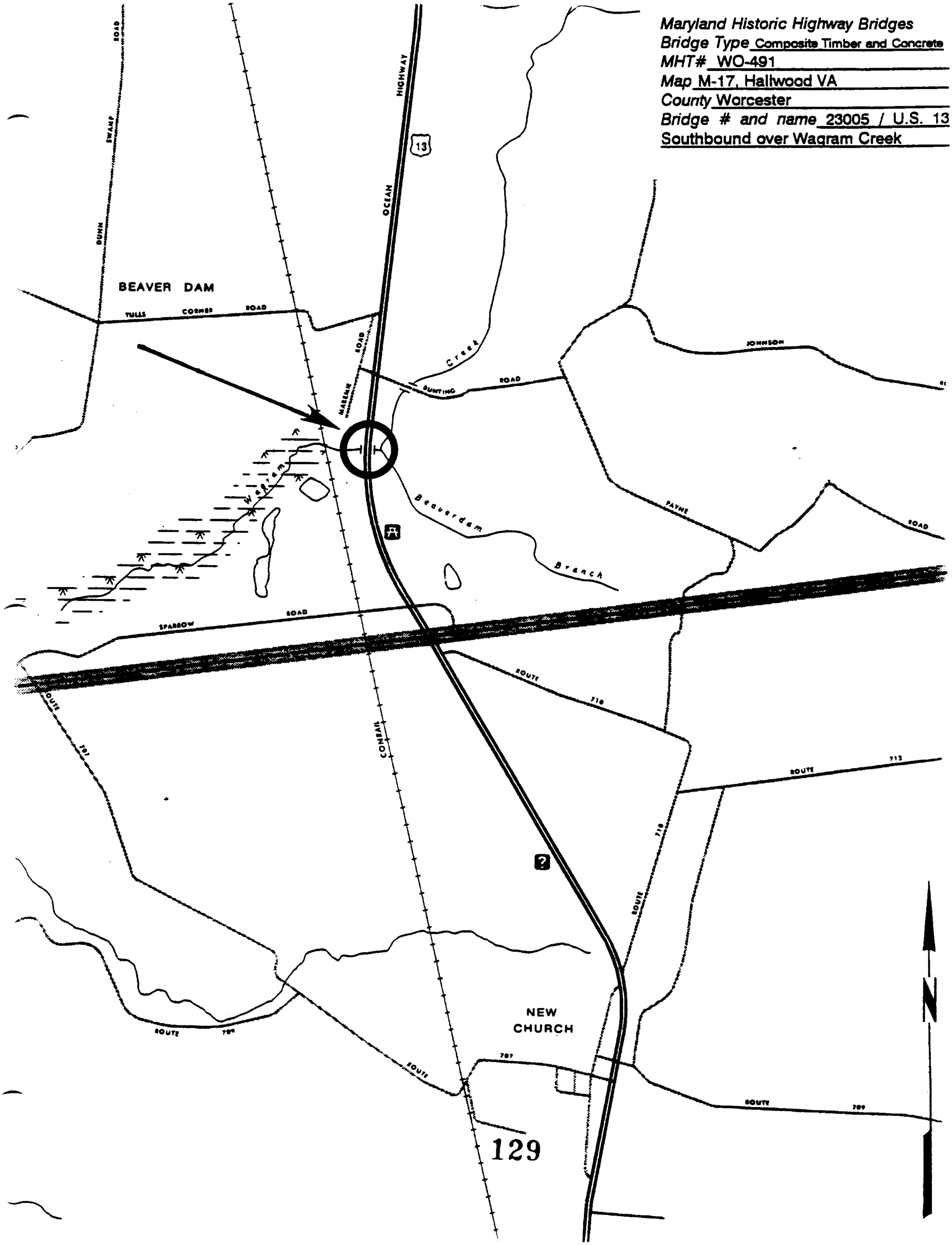
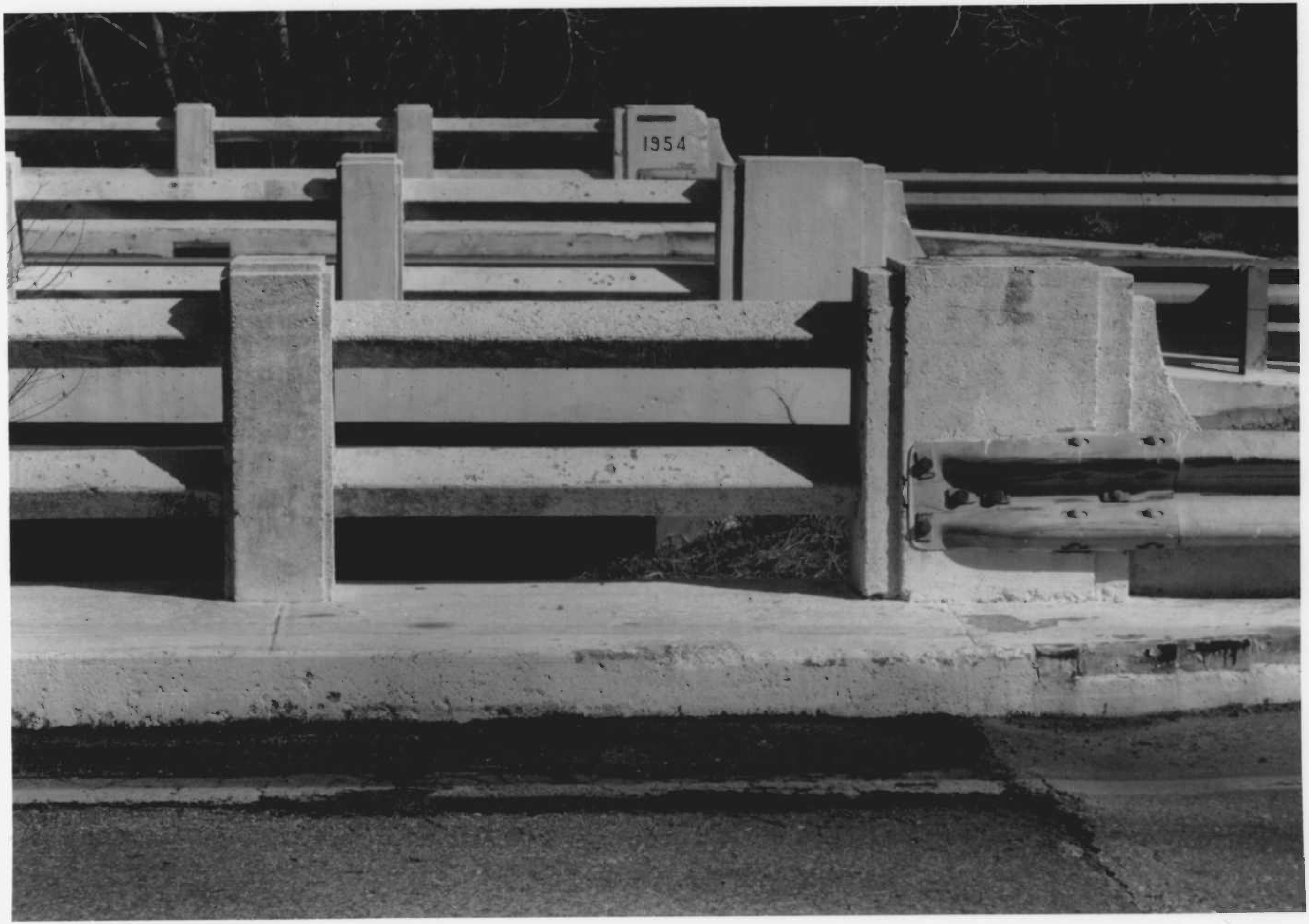
Tyrrell, H. Grattan
1909 *Concrete Bridges and Culverts for Both Railroads and Highways.* The Myron C. Clark Publishing Company, Chicago and New York.

**SURVEYOR:**

**Date bridge recorded** February 1998
**Name of surveyor** Caroline Hall/Marris German
**Organization/Address** P.A.C. Spero & Co., 40 W. Chesapeake Avenue, Baltimore, MD 21204/ Wallace Montgomery and Associates, 110 West Road, Towson, MD 21204
**Phone number** (410) 296-1635 **FAX number** (410) 296-1670
Revised by P.A.C. Spero & Company, July 1998.

*Maryland Historic Highway Bridges*
*Bridge Type* Composite Timber and Concrete
*MHT#* WO-491
*Map* M-17, Hallwood VA
*County* Worcester
*Bridge # and name* 23005 / U.S. 13 Southbound over Wagram Creek

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2 U.S. 13 SB over Wagram Creek

3 Worchester Co. MD

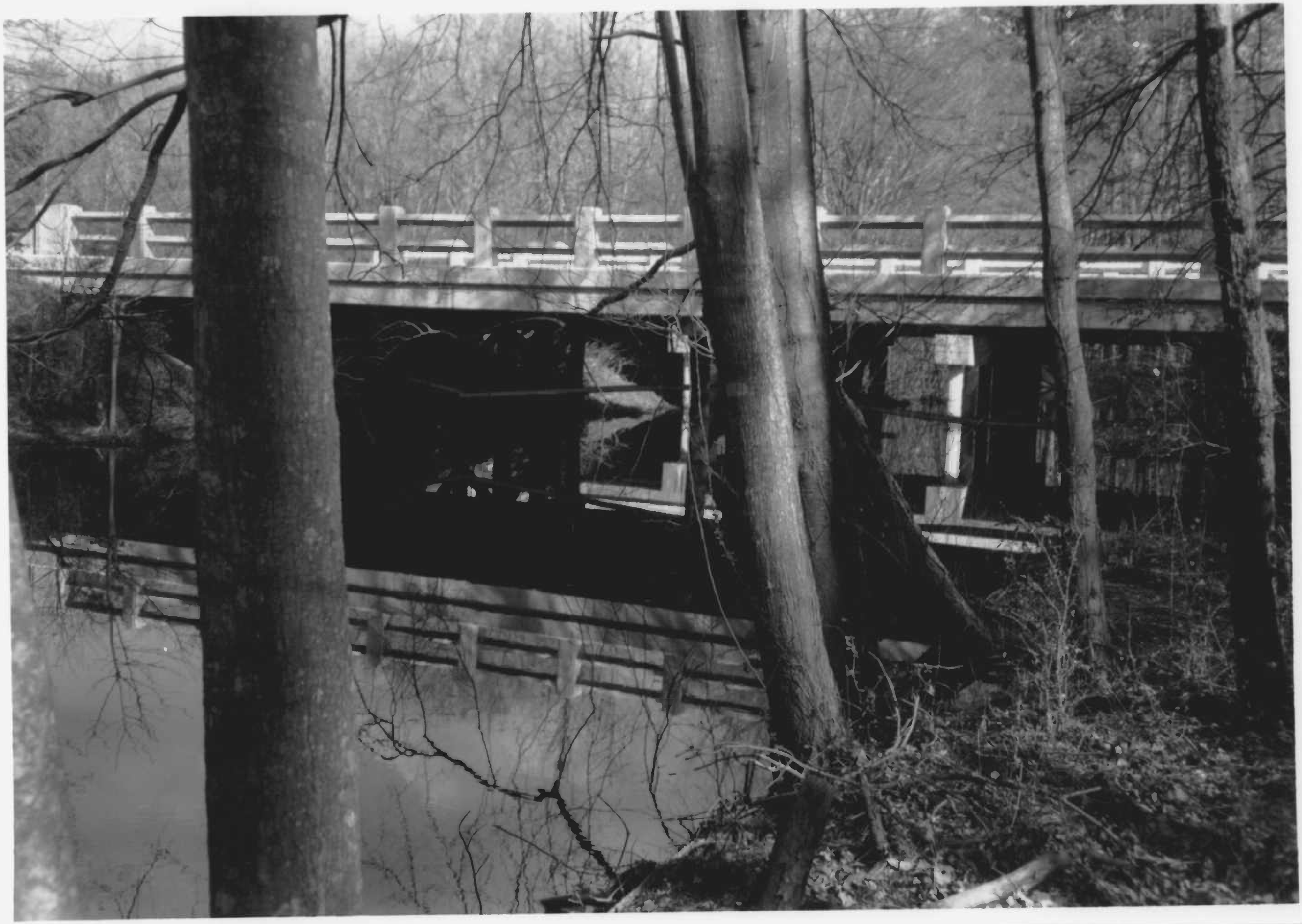
4 3/98

5 Marris German, WMA

6 MD SHPO

7 Concrete Railing East Side

8 1 of 5



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2 US 13 SB over Wagram Creek

3 Worchester Co., MD

4 3/98

5 Marris German, WMA

6 MD SHPO

7 Elevation Looking East

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2 US 13, SB over Wagram Creek

3 Worchester Co, MD

4 3/98

5 Morris German, WMA

6 MD SHPO

7 Elevation Looking West

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2 US 13, SB over Wagram Creek

3 Worchester Co, MD

4 3/98

5 Marris German

6 MD SHPO

7 Looking South

8 4 of 5

1 WO-491

2 US 13, SB over Wagram Creek

3 Worchester Co, MD

4 3/98

5 Marris German, WMA

6 MD SHPO

7 Looking North

8 5 of 5