

Maryland Historical Trust

Maryland Inventory of Historic Properties number: WD-489

Name: MD 354 OVER TILGHMAN RACE.

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.

<b>MARYLAND HISTORICAL TRUST</b>	
Eligibility Recommended <u>  X  </u>	Eligibility Not Recommended <u>      </u>
Criteria: <u>  A  </u> <u>  B  </u> <u>  C  </u> <u>  D  </u>	Considerations: <u>  A  </u> <u>  B  </u> <u>  C  </u> <u>  D  </u> <u>  E  </u> <u>  F  </u> <u>  G  </u> <u>None</u>
Comments: _____ _____	
Reviewer, OPS: <u>Anne E. Bruder</u>	Date: <u>  3  </u> April 2001
Reviewer, NR Program: <u>Peter E. Kurtze</u>	Date: <u>  3  </u> April 2001

**DESCRIPTION:**

**Setting:** Urban \_\_\_\_\_ Small town \_\_\_\_\_ Rural X \_\_\_\_\_

**Describe Setting:**

Bridge No. 23011 carries MD 354 (Whiton Road) over Tilghman Race in Worcester County. MD 354 runs north-south and Tilghman Race flows east-west. The bridge is located in the vicinity of Whiton, and is surrounded by farmland and wooded areas with some residential development.

**Describe Superstructure and Substructure:**

Bridge No. 23011 is a single-span, 2-lane, concrete beam bridge. The bridge was originally built in 1932, and the abutments and wing walls were parged circa 1992. The structure is 31 feet, 4 inches long and has a clear roadway width of 27 feet. The out-to-out width is 30 feet. The superstructure consists of concrete beams which support a concrete deck and concrete parapets. The concrete deck has a bituminous wearing surface and the structure has pierced concrete parapets. The roadway approaches have steel guard rails. The substructure consists of two (2) concrete abutments and flared, concrete wing walls. The bridge has a sufficiency rating of 86.3.

According to the 1996 inspection report, this structure is in fair condition with cracking and some spalling on both the interior and exterior beams. The abutments and wing walls have cracking and concrete erosion at the water line. The parapets have vertical and map cracks with minor chipping at the edges.

**Discuss Major Alterations:**

Bridge No. 23011 has had no major alterations. In 1992, the abutments and wing walls were parged.

**HISTORY:**

**WHEN was the bridge built:** 1932 \_\_\_\_\_

**This date is:** Actual X \_\_\_\_\_ Estimated \_\_\_\_\_

**Source of date:** Plaque \_\_\_\_\_ Design plans \_\_\_\_\_ County bridge files/inspection form \_\_\_\_\_

**Other (specify):** State Highway Administration bridge files/inspection form

**WHY was the bridge built?**

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

**WHO was the designer?**

Unknown

**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 concrete beam construction. The structure has a high degree of integrity and retains such character-defining elements of the type as the concrete slab, pierced parapets, concrete abutments and wing walls.

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

The earliest concrete beam bridges in the nation were deck girder spans that featured concrete slabs supported by a series of longitudinal concrete beams. This method of construction was conceptually quite similar to the traditional timber beam bridge which had found such widespread use both in Europe and in America. Developed early in the twentieth century, deck girder spans continued to be widely used in 1920 when noted bridge engineer Milo Ketchum wrote *The Design of Highway Bridges of Steel, Timber and Concrete* (Ketchum 1920).

Although visually similar to deck girder bridges, the T-beam span features a series of reinforced concrete beams that are integrated into the concrete slab, forming a monolithic mass appearing in cross section like a series of upper-case "T"s connected at the top. Thaddeus Hyatt is believed to have been the first to come upon the idea of the T-beam when he was studying reinforced concrete in the 1850s, but the first useful T-beam was developed by the Belgian Francois Hennebique at the turn of the present century (Lay 1992:293). The earliest references to T-beam bridges refer to the type as concrete slab and beam construction, a description that does not distinguish the T-beam design from the concrete deck girder. Henry G. Tyrrell was perhaps the first American bridge engineer to use the now standard term "T-beam" in his treatise *Concrete Bridges and Culverts*, published in 1909. Tyrrell commented that "it is permissible and good practice in designing small concrete beams which are united by slabs, to consider the effect of a portion of the floor slab and to proportion the beams as T-beams" (Tyrrell 1909:186).

By 1920, reinforced concrete, T-beam construction had found broad application in standardized bridge design across the United States. In his text, *The Design of Highway Bridges of Steel, Timber and Concrete*, Milo S. Ketchum included drawings of standard T-beam spans recommended by the U.S. Bureau of Public Roads as well as drawings of T-beam bridges built by state highway departments in Ohio, Michigan, Illinois, and Massachusetts (Ketchum 1920). By the 1930s the T-beam bridge was widely built in Maryland and Virginia.

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. By 1930, Maryland's primary system had been inadequate to the huge freight trucks and volume of passenger cars in use, with major improvements occurring in the late 1930's. Most improvements to local roads waited until the years after World War I.

In the early years, there was a need to replace the numerous single lane timber bridges. Walter Wilson Crosby, Chief Engineer, stated in 1906, "the general plan has been to replace these [wood bridges] with pipe culverts or concrete bridges and thus forever do away with the further expense of the maintenance of expensive and dangerous wooden structures." Within a few years, readily constructed standardized bridges of concrete were being built throughout the state.

In 1930, the roadway width for all standard plan bridges was increased to 27 feet in order to accommodate the increasing demands of automobile and truck traffic (State Roads Commission 1930). The range of span lengths remained the same, but there were some changes designed to increase the load bearing capacities. The reinforcing bars increased in thickness. Visually, the 1930 design can be distinguished from its predecessors by the pierced concrete railing that was introduced at this time.

In 1933, a new set of standard plans were introduced by the State Roads Commission. This time their preparation was not announced in the Report; new standard plans were by this time nothing special - they had indeed become standard. Once again accommodating the ever-increasing demands of traffic, the roadway was increased, this time to 30 feet. The slab span's reinforcing bars remained the same diameter but were placed closer together to achieve still more load capacity.

**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?**

Bridge 23011 is a potentially significant example of the State Roads Commission standard bridge plans of the 1930s, which retains 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 concrete slab, pierced parapets, concrete abutments and wing walls.

**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):

Ketchum, Milo S.

1908 *The Design of Highway Bridges and the Calculation of Stresses in Bridge Trusses.* The Engineering News Publishing Co., New York.

1920 *The Design of Highway Bridges of Steel, Timber and Concrete.* Second edition. McGraw-Hill Book Company, New York.

Lay, Maxwell Gordon

1992 *Ways of the World: A History of the World's Roads and of the Vehicles That Used Them.* Rutgers University Press, New Brunswick, New Jersey.

Luten, Daniel B.

1912 *Concrete Bridges.* *American Concrete Institute Proceedings* 8:631-640.

1917 *Reinforced Concrete Bridges.* National Bridge Company, Indianapolis, Indiana.

Maryland State Roads Commission

1930a *Report of the State Roads Commission for the Years 1927, 1928, 1929 and 1930.* State of Maryland, State Roads Commission, Baltimore.

1930b *Standard Plans.* State of Maryland, State Roads Commission, Baltimore.

Taylor, Frederick W., Sanford E. Thompson, and Edward Smulski

1939 *Reinforced-Concrete Bridges with Formulas Applicable to Structural Steel and Concrete.* John Wiley & Sons, Inc., New York.

Tyrrell, H. Grattan

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

**SURVEYOR:**

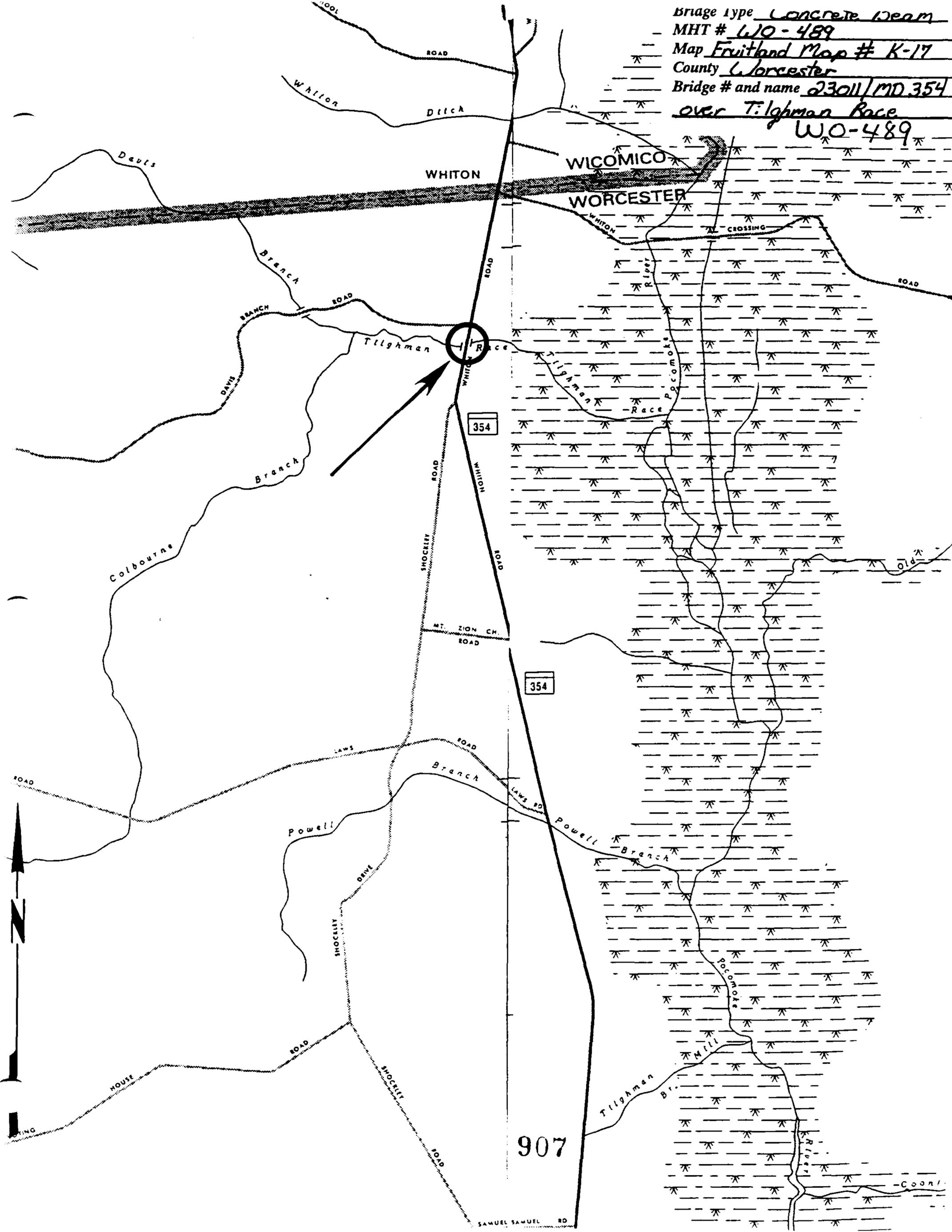
Date bridge recorded  2/25/97

Name of surveyor  Caroline Hall

Organization/Address  P.A.C. Spero & Co., 40 W. Chesapeake Avenue, Baltimore, MD 21204

Phone number  (410) 296-1685  FAX number  (410) 296-1670

Bridge type Concrete Beam  
MHT # WO-489  
Map Fruitland Map # K-17  
County Worcester  
Bridge # and name 23011/MD.354  
over Tilghman Race  
WO-489



907

SAMUEL SAMUEL RD

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

MHT No. WO-489

SHA Bridge No. 23011 Bridge name MD 354 over Tilghman Race

**LOCATION:**

Street/Road name and number [facility carried] MD 354 (Whiton Road)

City/town Whiton 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     :

Beam Bridge      Truss -Covered      Trestle      Timber-And-Concrete     

Stone Arch Bridge     

Metal Truss Bridge     

Movable Bridge     :

Swing      Bascule Single Leaf      Bascule Multiple Leaf     

Vertical Lift      Retractable      Pontoon     

Metal Girder     :

Rolled Girder      Rolled Girder Concrete Encased     

Plate Girder      Plate Girder Concrete Encased     

Metal Suspension     

Metal Arch     

Metal Cantilever     

Concrete X:

Concrete Arch      Concrete Slab      Concrete Beam X Rigid Frame     

Other      Type Name



(23011)

1. WD 489
2. 4 bridge ~~23011~~, MD 354 over Tilghman Race
3. Worcester County, MD
4. Caroline Hall
5. 3/97
6. MD SHPO
7. Bridge 23011, east parapet
8. 1 of 6



1. WO-489

(23011)

2. MD 354 over

3. Worcester Co., MD

4. Caroline Hall

5. 3/97

6. MD SHPC

7. East Parapet, Northeast Apartment

8. 2 of 6

Tighman  
Race



- 1 WO 489
- 2 MD 354 over Tilghman Race (23011)
- 3 Worcester Co., MD
- 4 Caroline Hall
- 5 3197
- 6 MD SHPO
- 7 Roadway Approach
- 8 3 of 6



1. W0489
2. MD 354 over T. Ighman Race (23011)
3. Worcester Co., MD
4. Caroline Hall
5. 3/97
6. MD SHPD
7. West parapet + NW abutment + WW
8. 4 of 6



1. WO 489

2. MD 354 over Tilghman Race (23011)

3. Worcester Co., Md.

4. Caroline Hall

5. 3/97

6. MD SHPO

7. East parapet + roadway

8. 5 of 6



1. WO 489
2. MD 354 over Tilghman Race (23011)
3. Worcester Co., Md.
4. Caroline Hall
5. 3/97
6. MD SHPD
7. roadway approach
8. 6 of 6

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

Property/District Name: Bridge #23011 Survey Number: WO-489

Project: Maintenance MD 354 over Tilghman Race Agency: SHA

Site visit by MHT Staff:  no  yes Name \_\_\_\_\_ Date \_\_\_\_\_

Eligibility recommended  Eligibility not recommended

Criteria:  A  B  C  D Considerations:  A  B  C  D  E  F  G  None

Justification for decision: (Use continuation sheet if necessary and attach map)

According to information provided by SHA, Bridge #23011 does not meet the criteria for individual listing on the Maryland Register of Historic Properties. The concrete girder bridge constructed in 1932 is one of about 100 similar structures built before that date. It has no engineering or historical significance. In addition, it is not located in any known historic district.

Documentation on the property/district is presented in: Project file

Prepared by: Rita Suffness

Elizabeth Hannold Reviewer, Office of Preservation Services February 18, 1993 Date

NR program concurrence:  yes  no  not applicable  
[Signature] Reviewer, NR program 2. 18. 93 Date

Survey No. WO- 489

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)
- 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
- Industrial/Urban Dominance A.D. 1870-1930
- Modern Period A.D. 1930-Present
- Unknown Period (  prehistoric  historic)

III. Prehistoric Period Themes:

- Subsistence
- Settlement
- Political
- Demographic
- Religion
- Technology
- Environmental Adaption

IV. Historic Period Themes:

- Agriculture
- Architecture, Landscape Architecture, and Community Planning
- Economic (Commercial and Industrial)
- Government/Law
- Military
- Religion
- Social/Educational/Cultural
- Transportation

V. Resource Type:

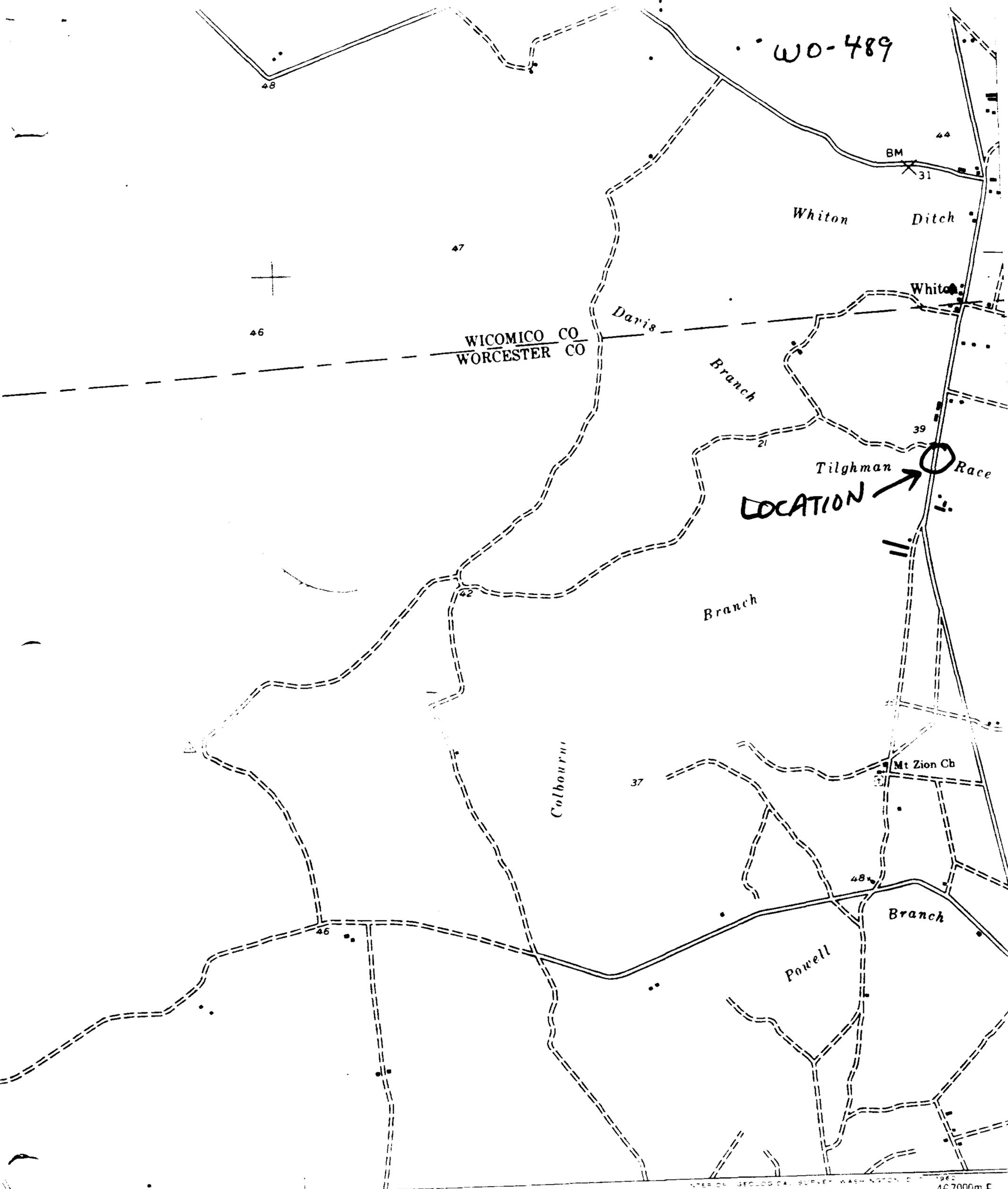
Category: Structure

Historic Environment: Rural

Historic Function(s) and Use(s): Transportation

Known Design Source: Unknown

WO-489



WICOMICO CO  
WORCESTER CO

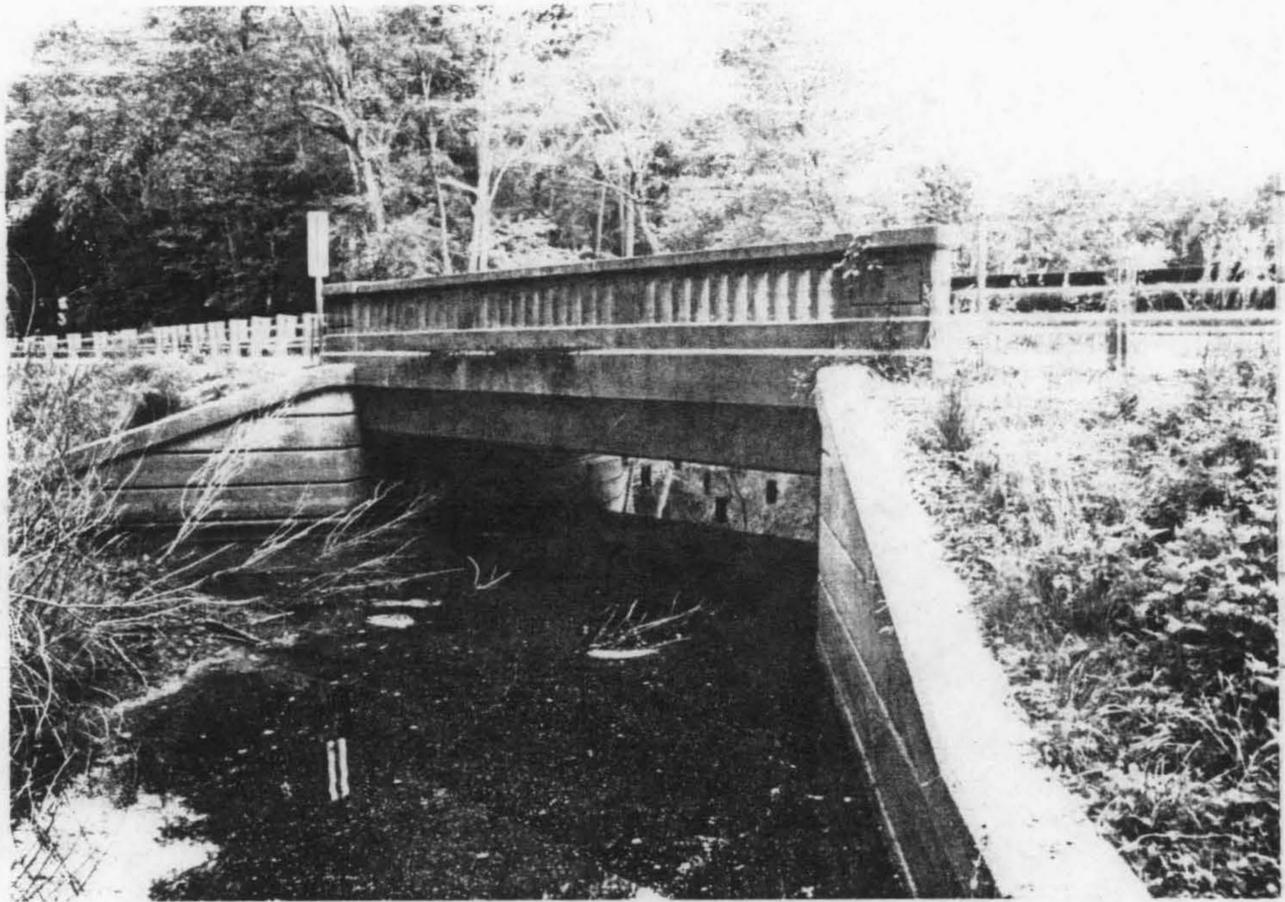
**LOCATION** →

WANGO  
QUAD

UNITED STATES GEOLOGICAL SURVEY WASHINGTON D.C. 20508  
1962  
467000m E.

ROAD CLASSIFICATION

WO-489



Elevation view of west side

Bridge #23011