Maryland Historical Trust

Maryland Inventory of Historic Properties number: CAR-297

Name: #5017/MD 404 Alt. over Tuckahoe Creek

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 ____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 **MHT No.** CAR-297
HISTORIC BRIDGE INVENTORY
MARYLAND STATE HIGHWAY ADMINISTRATION/
MARYLAND HISTORICAL TRUST

SHA Bridge No. 5017 **Bridge name** MD 404 Alternate over Tuckahoe Creek

LOCATION:
Street/Road name and number [facility carried] MD 404 Alternate (Main Street)

City/town Queen Anne **Vicinity** X

County Caroline

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 _____ **Retractile**_____ **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** _____

DESCRIPTION:

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

Describe Setting:

Bridge No. 5017 carries MD 404 Alternate (Main Street) over Tuckahoe Creek in Caroline County. MD 404 Alternate runs east-west and Tuckahoe Creek flows north-south. The bridge is located in the vicinity of Queen Anne, and is surrounded by residential and commercial properties.

Describe Superstructure and Substructure:

Bridge No. 5017 is a 3-span, 2-lane, concrete beam bridge. The bridge was originally built in 1915, and in 1980, steel beams and piles were installed adjacent to the original piers and abutments to support the structure. The structure is 97 feet long and has a clear roadway width of 30 feet. The out-to-out width is 34 feet. The superstructure consists of T-beams which support a concrete deck and concrete parapets. The concrete deck has a bituminous wearing surface. The structure has pierced, concrete parapets with steel guard rails attached to the parapet along the roadway, which continue along the roadway approaches. The substructure consists of two (2) concrete abutments and two (2) concrete piers, which are no longer structural. Adjacent to the original abutments and piers are steel pile bents which were added to the structure in 1980 to support the deck and concrete beams. There are flared concrete wing walls and the bridge has a sufficiency rating of 79.8.

According to the 1996 inspection report, this structure was in satisfactory condition. The concrete girders had fine longitudinal and map cracking and some shallow popouts. The original concrete abutments had severe spalling and the concrete piers were in poor condition with severe spalling and section loss. The steel pile bents, which were added in 1980, had light rust and peeling paint. The wing walls had map cracking and some moisture stain. The concrete parapet had minor chipping and spalling on the base. The bases also have fine transverse cracking.

Discuss Major Alterations:

In 1980, steel pile bents were installed adjacent to the original piers and abutments. These bents now carry the load and although the abutments and piers remain, they are no longer structural.

HISTORY:

WHEN was the bridge built: 1915
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?

The bridge was altered to ensure its structural integrity.

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 good integrity and retains such character-defining elements of the type as longitudinal beams and slab, integral parapets, abutments, piers, and wing walls. Despite the alterations to the structure in 1980, the original substructure elements remain intact and the new structural elements do not significantly compromise the integrity of the bridge.

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?

The bridge is a potentially significant example of a concrete beam 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 longitudinal beams and slab, integral parapets, abutments, piers, 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):

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

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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 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 # CAR-297
Map Ridgley Map # F-15
County Caroline
Bridge # and name 5017/MD 404
Alt. over Tuckahoe Creek

PARK
SHOE ROAD
HORSE SHOE ROAD
EVELAND ROAD
309
STARR ROAD
TUCKAHOE CREEK
QUEEN ANNES HIGHWAY
480
HILLSBORO RID GELY ROAD
404
SHORE HIGHWAY
ALT 404
FLOWERS ROAD
CORDOVA ROAD
303
WYE MILLS
QUEEN ANNES ROAD
CREEK
BUTLER
BUTLER CT
ALT 404
HILLSBORO DENTON
ST 21641
21657
CHURCH ST
THOMAS TOWN
HILLSBORO
POP. 164
QUEEN ANNE
TOTAL POP. 250
Q.A. CO. 140
TALBOT CO. 110
MARYLAND DEPARTMENT OF TRANSPORTATION (OUT OF SERVICE)
OLD CORDOVA ROAD
CANTERY RD
Horwich Cr
TUCKAHOE ROAD
CAROLINE CO.
TALBOT CO.
BLADES ROAD EAST
TUCKAHOE CREEK
Ralphs Landing
314
FLEMING ROAD
STONEY POINT ROAD
MAP NO G-15
TO EASTON
1610
1100

1. CAR-297

2. MD 404 Alt. over Jackson Creek (507)

3. Caroline Co., MD

4. Caroline Hall

5. 3/97

6. MDSHPO

7. north side

8. 1 of 6


DO NOT
THROW
LITTER
$1000.00
FINE
TALBO
COUN
TUCKAHO
RIVER
NO
FISHING
FROM
BRIDGE

1. CAE-297
2. MD 404 Alt over Tuckahoe Creek (5017)
3. Caroline Co, MD
4. Caroline Hall
5. 3/97
6. MDSHPO
7. roadway approach
8. 2016

1. CAR-297

2. MD 404 Alt over Juckahoe Creek

3. Caroline County, MD (5017)

4. Caroline Hall

5. 3/97

6. MDSHPO

7. south side

8. 3 of 6

1. CAR-297

2. MD 404 Alt. over Tuckahoe Creek (5017)

3. Caroline County, MD

4. Caroline Hall

5. 3/97

6. MDSHPO

7. roadway approach

8. 4 of 6

1. CAR-297

2. MD 404 Alt over Tuckahoe Creek (5017)

3. Caroline County, MD

4. Caroline Hall

5. 3/97

6. MDSHPO

7. south parapet wall

8. 5 of 6

1. CAE-297

2. MD 404 Alt. over Tuckahoe Creek (5017)

3. Caroline County, MD

4. Caroline Hall

5. 3/97

6. MDSHPO

7. north parapet wall

8. 6 of 6