

Maryland Historical Trust

Maryland Inventory of Historic Properties Number: CE-1493

Name: MD 316 over Rappell Creek / 7047

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

2001

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

MHT No. CE-1493

SHA Bridge No. 7047 Bridge name MD 316 over Big Elk Creek

LOCATION:

Street/Road name and number [facility carried] MD 316 (Appleton Road)

City/town Elkton Vicinity X

County Cecil

This bridge projects over: Road Railway Water Land

Ownership: State County Municipal Other

HISTORIC STATUS:

Is the bridge located within a designated historic district? Yes No

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 :

Concrete Arch Concrete Slab Concrete Beam Rigid Frame

Other Type Name _____

DESCRIPTION:

Setting: Urban _____ Small town _____ Rural X

Describe Setting:

Bridge No. 7047 carries MD 316 (Appleton Road) over Big Elk Creek in Cecil County. MD 316 runs north-south and Big Elk Creek flows east-west. The bridge is located in the vicinity of Elkton and is surrounded by farmland.

Describe Superstructure and Substructure:

Bridge No. 7047 is a 1-span, 2-lane, concrete beam bridge. Inspection reports state that the bridge was constructed in 1931. However, an interoffice memo from 1990 states that the structure more closely resembles the 1912 standardized plan. Therefore, the precise date of construction as indicated in the inspection reports cannot be confirmed. The parapets were removed and replaced with w-section guard rails at an unknown date, and the southeast and northeast wing walls were replaced in 1993. The structure is 25 feet long and has a clear roadway width of 22 feet. The out-to-out width is 25 feet, 5 inches. The superstructure consists of five (5) T-beams which support a concrete deck and w-section guard rails. The beams measure 6½ inches x 18½ inches and are spaced 5 feet, 8 inches apart. The slab, an integral part of the T-beam, measures 2 feet, 6 inches thick, and it has a bituminous wearing surface. The roadway approaches are straight and level with the bridge. The substructure consists of two (2) concrete abutments. There are two (2) flared and two (2) u-shaped concrete wing walls. The bridge has a sufficiency rating of 78.2.

According to the 1996 inspection report, this structure is in satisfactory condition with structural elements showing only minor deterioration. The asphalt wearing surface has longitudinal, map and transverse cracks and both lanes are rutted. The abutments and concrete beams have vertical and map cracking.

Discuss Major Alterations:

The original parapets were removed and replaced with w-section guard rails at an unknown date. Inspection reports from 1995 indicate that the northeast and southeast wing walls were replaced in 1993.

HISTORY:

WHEN was the bridge built: Unknown

This date is: Actual _____ 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?

State Roads Commission

WHO was the builder?

State Roads Commission

WHY was the bridge altered?

The bridge was altered to correct functional or structural deficiencies.

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

The bridge was constructed by the State, as part of a campaign to increase load capacity on secondary roads during the early twentieth century.

SURVEYOR/HISTORIAN ANALYSIS:

This bridge may have National Register significance for its association with:

- A - Events _____ B- Person _____
 C- Engineering/architectural character _____

The bridge does not have National Register significance.

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?

A significant example of a concrete bridge should possess character-defining elements of its type, and be readily recognizable as an historic structure from the perspective of the traveler. The integrity of distinctive features visible from the roadway approach, including parapet walls or railings, is important in structures which are common examples of their type. In addition, the structure must be in excellent condition. The bridge's integrity of distinctive features visible from the roadway and the integrity of other important elements has been compromised with the removal of the original parapets and northeast and southeast wing walls.

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

This bridge was altered, resulting in the loss of such character-defining elements as the original parapets and northwest and southeast 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 the State Roads Commission.

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.

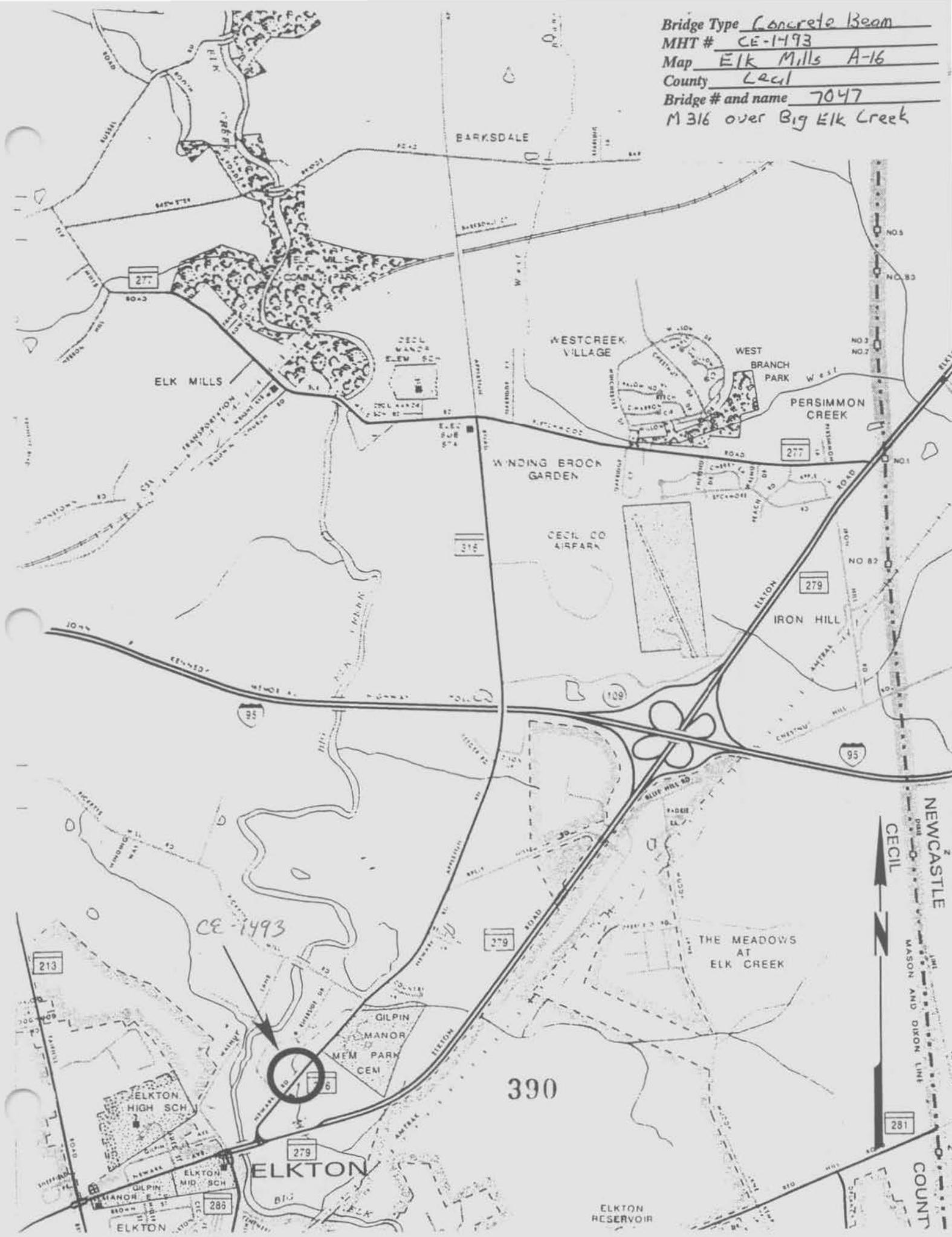
1917 *Reinforced Concrete Bridges*. National Bridge Company, Indianapolis, Indiana.

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.

Bridge Type Concrete Beam
 MHT # CE-1493
 Map Elk Mills A-16
 County Cecil
 Bridge # and name 7047
M 316 over Big Elk Creek





1. CE-1493
2. MD316 OVER BIGEY Creek (7047)
3. Cecil
4. Eric Griffiths
5. 3-97
6. MA SHPO
7. EAST Elevation
8. 1 of 6



1 CE-1493

2 MD 316 over Big Elk Creek
(7047)

3 Cecil

4 ERIC Griffiths

5 3-97

6 MD SHPO

7. detail of beams + North
Abutment

8. 2076



- 1 CE-1493
- 2 MD 316 over Big Elk Creek (7047)
- 3 Cecil
- 4 Eric Griffiths
- 5 3-97
- 6 MD SHPO
- 7 West elevation
- 8 4 of 6



- 1 CE-1493
- 2 MD 316 over Big Elk Creek
- 3 Cecil (7047)
- 4 ERIC Griffiths
- 5 3-97
- 6 MD SHPO
- 7 detail of Paraper Reconstruction
- 8 5 of 6



1 CE = 1493

2 MD 316 over Big Elk Creek
(7047)

3 Cecil

4 Eric Griffiths

5 3-97

6 MD SHPO

7 South Approach

8 6 of 6



- 1 CE-1493
- 2 MD 316 over Big Elk Creek
- 3 Cecil (7047)
- 4 Eric Griffiths
- 5 3-97
- 6 MD SHPO
- 7 North approach
- 8 30F6

Survey No. CE- 1493

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

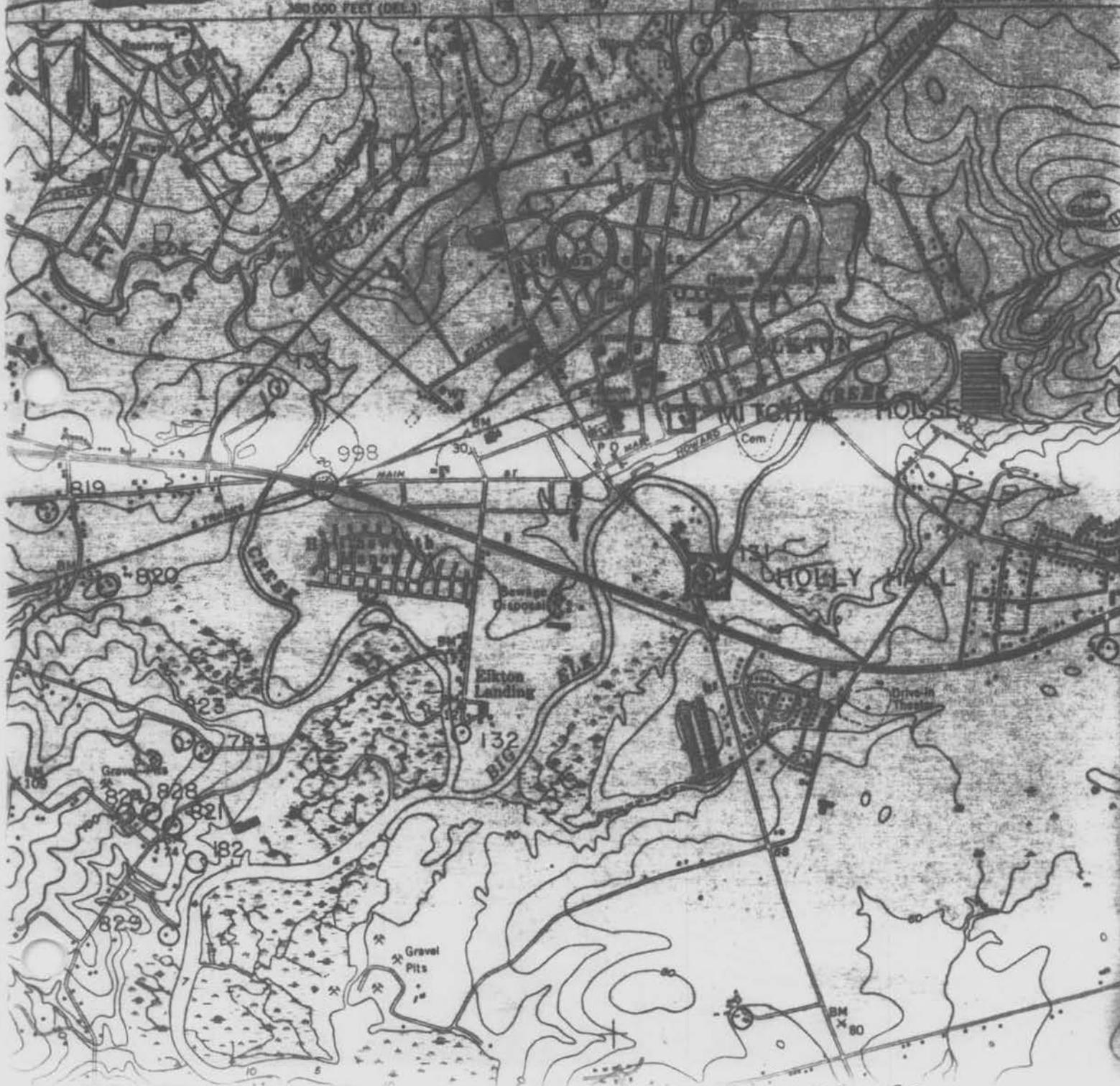
THE INTERIOR SURVEY

CECIL

CE-1493

7047

380,000 FEET (DEL.)



CE-1493

Bridge

7047

CE-1493

