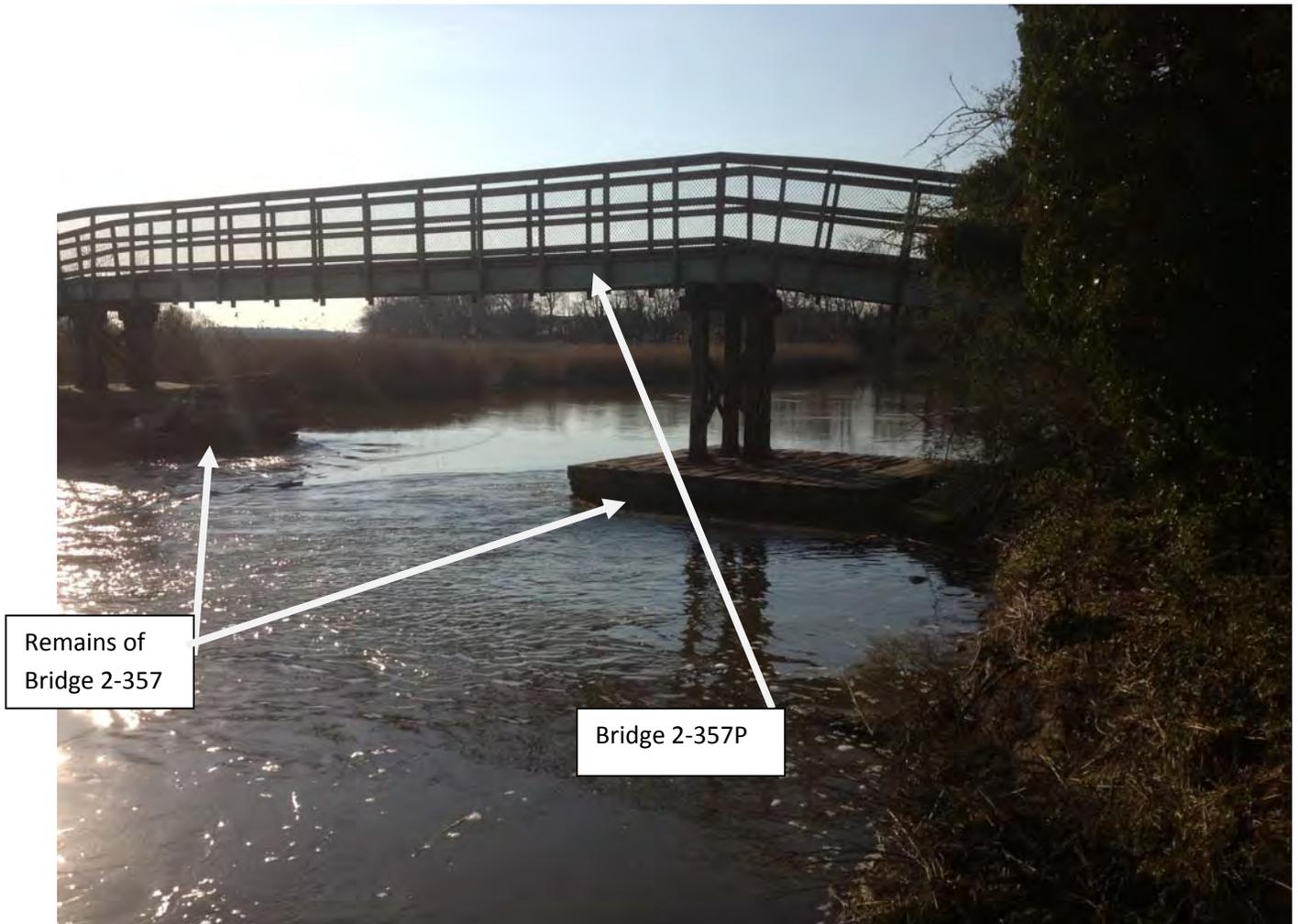


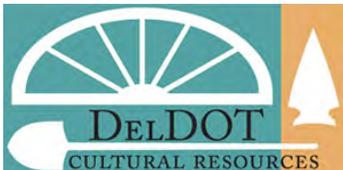
Bridge 2-357P (Pedestrian) National Register Evaluation

Under State Contract T201407501



**DELAWARE DEPARTMENT OF TRANSPORTATION
PREPARED BY: NATHANIEL DELESLINE and MICHAEL C. HAHN, AICP**

JULY 2014



Introduction

The Delaware Department of Transportation (DelDOT) is removing State Bridge Number 2-357P near Old Lebanon Road. The bridge is located near the south end of road 356A (Lebanon Road) in Kent County, Delaware (State Contract # 7607012). In serving as a pedestrian/bike crossing, the bridge carries Old Lebanon Road (Road 357) from its intersection with Lebanon Road (356A) eastward across the St. Jones River and through marshland to a point at Dover Air Force Base. The entire bridge (super and sub-structure) is being removed because it is no longer deemed safe for use due to deterioration, water damage, and settlement. In addition the bridge crossing and path has been closed due to security reasons with its connection into/at the Dover Air Force Base Housing Property. The project consists of removing the two-girder steel superstructure with timber decking/rails, timber piers, timber piles, and the remaining portions of the original stone/concrete foundation at the east end. Additional work includes placing R-5 riprap along the stream bank to prevent erosion and removal of any timber piles in the water.

The project requires a U.S. Army Corps of Engineers Nationwide Permit. As such, they are the lead federal agency and will define the "Permit Area" for Section 106 coordination to include the existing bridge structure.

Background information of the bridge crossing and of the area comes from DelDOT's *Archaeological and Historical Survey of Lebanon and Forest Landing Road 356a North Murderkill Hundred Kent County, Delaware, 1989*. As indicated in the historic background literature, the existing Bridge 2-357P originally dates back to circa 1880 (as far as materials) and is a complement of several alterations and improvements. For purposes of this survey, only the circa 1911 east abutment remains. They are used as part of the pedestrian crossing bridge at the east pier end. A portion of the original timber piles, dating back to circa 1880, may exist at the west end. The current three-span pedestrian/bike crossing was constructed in 1976. In the 1976 effort, the abandoned abutment and timber pile supports from the former crossing were utilized as part of the new timber piles for foundation supports.

Origins of the new pedestrian/bike crossing began in the early 1970's as development grew in Lebanon and in the expansion of the Dover Air Force Base and military housing requirements. The expansion of base housing at Lebanon and a school (Allen Frear) called for a safe pedestrian crossing and a more direct route to/from the main military base entrance as well as other base housing beyond the tidal marshlands of Saint Jones. Following construction, the bicycle/pedestrian crossing also served as an alternative to busing service since transportation may not have routed children to Allen Frear with limited distances (i.e. youth could walk/bike to school).

Based on lack of significance and integrity, Bridge 2-357P is not eligible for listing on the National Register of Historic Places. This includes any of the past structural components that might remain as part of structure. The eastern pier or abutment end consists of a former stone and concrete abutment dating circa 1911. The western pier, known to be in place circa 1880 is a larger set of timber planks/cribbing connected together and seemingly replaced. They (the timber cribbing) would have hosted the pivot rotating device on a moveable bridge. The former pivot swing bridge allowed motorized vehicular traffic and others traveling along Road 357 to cross the Saint Jones and connect into other

Dover Air Force Base housing and the base's main military entrance. However, the bridge connection to Lebanon has a much greater historical past with shipping and commerce, and predates the Dover Air Force Base. As shipping commerce shifted/dwindled and other alternative main roads were added north of Lebanon, the former swing bridge and road were taken out of service and removed from the roadway inventory in the late 1960's and again in the 1990's. Even as a pedestrian/bike crossing, the bridge has remained idle and closed for a number of years as a publically accessible route.

DelDOT cultural resources staff, recognized as meeting the Secretary of the Interior's Professional Qualification Standards in the fields of history and architectural history, completed the following evaluation. All past records and correspondence remain at DelDOT and at the Division of Historic and Cultural Affairs.

Summary

Based on a lack of significance and integrity, Bridge 2- 357P is not eligible for listing on the National Register of Historic Places. This includes anything structurally complementary to this crossing.

Location

Old Lebanon Road (357) intersects Lebanon Road (356A) at the west end and Bay Road (State Route 1) at the east end (see **Figure 1**). The road carries Bridge 2-357P, a pedestrian/bicycle bridge and path of a former road, over the Saint Jones River. Road 357 once served as a main transportation route connecting Lebanon/Rising Sun and sections of southeast Dover such as Kitts Hummock and the Dover Air Force Base.

Age

The west abutment timber pier is circa 1880 (if anything is really present or original); the east stone/concrete abutment is circa 1911; and concrete approach slabs circa 1940. The three span, two-girder timber deck with timber piers had been added in 1976.

Description

The structure is a two-girder steel I-beam superstructure with timber decking. Timbers cross bent piles are situated on top at either end of the former bridge abutments. The abutment remains are part of a stone/concrete foundation present at the east end and a timber cribbing system on the west end. The stone portions on the east abutment end have fallen apart where mortar does not exist between stones. The stones appear to have been patched or bonded together by concrete, which have also fallen apart and is in a state of disrepair. DelDOT research did not produce a date for the construction of the timber cribbing system at the western timber pier, but the structure (as whole) is not original. However, many underlying timbers within the cribbing system may date to circa 1880. The visual evident timbers, including those within the cribbing on the west pier end, are treated with a wood preservative (creosote) or are pressure treated. Overall, the bridge and its structural systems appear to be compromised by settlement, water damage, and deterioration.

Dimensions

The circa 1911 stone, concrete and mortar abutment system has two (2) feet thick walls and are set in an irregular un-coursed laid pattern. They are approximately three (3) feet in height from the former concrete slab approach road (Road 357) that is twenty (20) feet wide.

The attached or above 1976 bridge has steel I-beam girders spaced approximately 4 feet, 8 ½ inches apart. The beams of each span are exactly 48.23 feet, 59 feet and 58.31 feet and are supported onto treated timber piers with cross bracing. The steel beams for the deck have a series of steel perpendicular floor beams spaced between girders for structural support. The deck is over topped with a timber floorboard walkway and a timber with 7-foot chain link railing. The bridge travel width is spaced at (5) feet wide.

The timber cribbing system that is arranged to support the western pier section consists of a four (4) layer system. The overall timber dimensions are approximately nineteen (19) feet long by 18 feet, 10 inches wide. Each nineteen foot long timber section is approximately ten (10) inches in height by 11½ inches wide. Twenty five (25) circular timber piles form the initial base and are set below into the ground of the Saint Jones River. Five (5) sets of timbers lie directly on top of the piles. Ten (10) timbers equally spaced apart are situated perpendicular and are set on top of the five sets. The next layer consists of the same sized timber planks (19 totals) that are aligned tightly together and lie perpendicular to previous layer. The top layer is perpendicular to the layer below and consists of the same number of timber planks. The timbers are fitted together by drilled holes and secured by a rebar spike. Other aged timbers, stone, and sections of broken concrete are evident within the waterway and lie within the remains of the concrete abutments that help form the top river embankment and portions of homemade rip-rap from scrap materials.

Maps/Contracts Viewed

Beers Atlas (1868), State contract 76-07-012, State Contract RM 121, (See **Figure 2**); Roadway Inventories, State Highway Maps (various years)

History

“Bridge 357P, the former Lebanon swing bridge (BR 2-357), was built by Kent County Levy Court and was adopted into the state system when the State Highway Department took over county roads. The exact age of the final wrought iron span is not known, but Department documents suggest 1880.

The first mention of such a bridge at this location is found in a 1794 legislative petition, signed by 21 citizens including the Hunns and a number of their Camden neighbors. The petitioners suggested a toll drawbridge to be authorized by the legislature (1794 legislative petition, Delaware Archives).

A pivot bridge is mentioned in Levy Court document of 1845 (Levy Court loose paper February 19, 1845). There was a “new” pivot bridge here in 1856 (Kent County Deed Book 0-4:360), which apparently replaced a drawbridge, which is pictured in a plot dated 1822 of Ezskiel Hunn’s lot. Hunn

may have built the bridge; contemporary documents credit him with building the road from the bridge to Rising Sun.

In 1911, Levy Court advertised for bids to rebuild the eastern bridge abutment, a stone structure that supported the mechanism, which still is part of the current structure.

After many years of service, the swing bridge was worn out and needed to be replaced. Construction of Dover Air Force Base during World War II (1940) had change Route 357 from a little-used back road into a major artery. A narrow, uneven causeway built for wagons was carrying heavy trucks and lines of commuters. The wood-decked bridge was soon posted for a five-ton load limit, but heavy trucks rumbled daily across its narrow deck.

The swing bridge was totally inadequate for its new role. On September 20, 1951, the State Highway Department authorized its replacement with a new movable bridge. In 1952, the Department obtained permission from the Corps of Engineers to replace the bridge with a new movable span. According to accounts, bridge work was to begin within two years. Time passed, and the project was never undertaken.

Under the River and Harbor Act of 1960, the United States abandoned the dredged channel of the St. Jones above Lebanon. In doing so, this removed the legal requirement to open the swing bridge for river traffic. As the old bridge continued to deteriorate, sixteen-inch steel beams were inserted under the span and across the river, immobilizing the span even more. The March storm of 1962 raised the river to within two inches of the deck, prompting further questions about its safety.

By that time, a new high-level bridge on a new upstream location was being planned (Current SR 10). In 1964, while the new bridge was being built, the state applied for federal permission to permanently shut the old bridge, but the proposal was dropped in the face of objections. The next year, the load limit was reduced to two tons. In 1966, the new Route 10 Bridge was finished and state bridge engineers began urging the immediate removal of the swing bridge for safety reasons. The old span's daily burden had dropped from more than 4000 to 1900 vehicles a day, but even with the I-beams underneath, it was becoming unstable. Removal was authorized by the Highway Department in February 1968. As a tribute to the past, the pivot swing bridge is illustrated in a 1964 photograph (**Figure 3**). It was a variation of a swing bridge with center tower and cable stays to support the spans free ends in the open position. DelDOT's staff further checked the historic bridge records, comparing Bridge 2-357 to be almost exactly the same type as the movable bridge that was once present in Odessa (BR 1-393 or referenced as HAER No. DE-28).

Most commuters never noticed that the bridge was gone, since it had become nothing but a back road from Lebanon to Dover Air Force Base. With construction of new base housing on Pickering farm in Lebanon in 1974, there was a renewed call for a replacement bridge at Lebanon. The Air Force Base schools are located near the east end of the Lebanon causeway, but children from the new housing were forced to travel out to Route 10 and down Route 113 to school. A footbridge was eventually installed in 1976 using portions of the old foundations for their convenience. It was re-assigned and recorded as State Bridge 2- 357P" (*Archaeological and Historical Survey of Lebanon and Forest Landing Road 356a North Murderkill Hundred Kent County, Delaware, 1989, pages 31-35*).

Evaluation

Bridge 2- 357P is evaluated for the National Register of Historic Places as part of a circa 1880 pivot swing bridge with several alterations. These include the 1911 reconstruction of the east abutment. Although undocumented, the stone abutments on the east end were likely reconstructed again as part of repairs in 1976 under the construction of the pedestrian/bike crossing. More recent timber cribbing seems to have been replaced at the western abutments, but this reconstructed pier is where the former swing pivot existed. Timber piles in the waterway are likely original. In addition, with preparation of the 1976 crossing, either end of the abandoned sections had been altered since new footer pads had to be constructed to support the new elevation of the timber piles. As such, the abutment sections have been modified.

Delaware with its coastline and numerous navigable waterways has a long history of movable bridges. However, Bridge 2-357P is not movable. The remnant of the stone abutments or timber piles at either end of the bridge is not a significant example on what remains as part of a former swing bridge. The remaining east end lacks integrity of design and association as a former bridge crossing or even as part of a current pedestrian/bike crossing.

In addition, the overall 1976 steel bridge is a common example of this type and does not exhibit any outstanding features or engineering accomplishments. As such, Bridge 2-357P as an entire structural component is not eligible for listing on the National Register of Historic Places.

Conclusion

Bridge 357P is recommended not eligible for the National Register of Historic Places, due to a lack of significance and integrity. The current 1976 bridge is a common steel I-beam type, and lacks significance. Even so the bridge crossing is consistent with the *Advisory Council on Historic Preservation Program Comments Issued for Streamlining Section 106 Review for Actions Affecting Post 1945 Concrete and Steel Bridges* (<http://www.gpo.gov/fdsys/pkg/FR-2012-11-16/pdf/2012-27866.pdf>). Delaware or federal agencies wishing to apply the program comment have this ability to waver out of Section 106 compliance with minimal reporting.

However, what is more important to note and conclude are portions of the stone abutments used in previous generations of a bridge crossing are recommended not eligible on their own. The circa 1911 east abutments end is still extant, but has been modified with a concrete pad established for the 1976 bridge as base for the new timber pier support. In its deteriorated state, what may be intact as part of a former bridge abutment is really an above ground ruin in various sections with missing stones. The stone parapets and back abutment wall are in a severe state of deterioration caused by settlement, cracking, and flooding. Although not documented, it appears that the stone sections were patched or re-bonded with the 1976 pedestrian/bike addition.

The timber cribbing evident on the west pier end formally supported a mechanical pivot swing for a movable bridge that once operated until it was removed in the late 1960's. In the 1976 construction of a smaller pedestrian/bike crossing, the timber cribbing sections appear to have been replaced. Taken

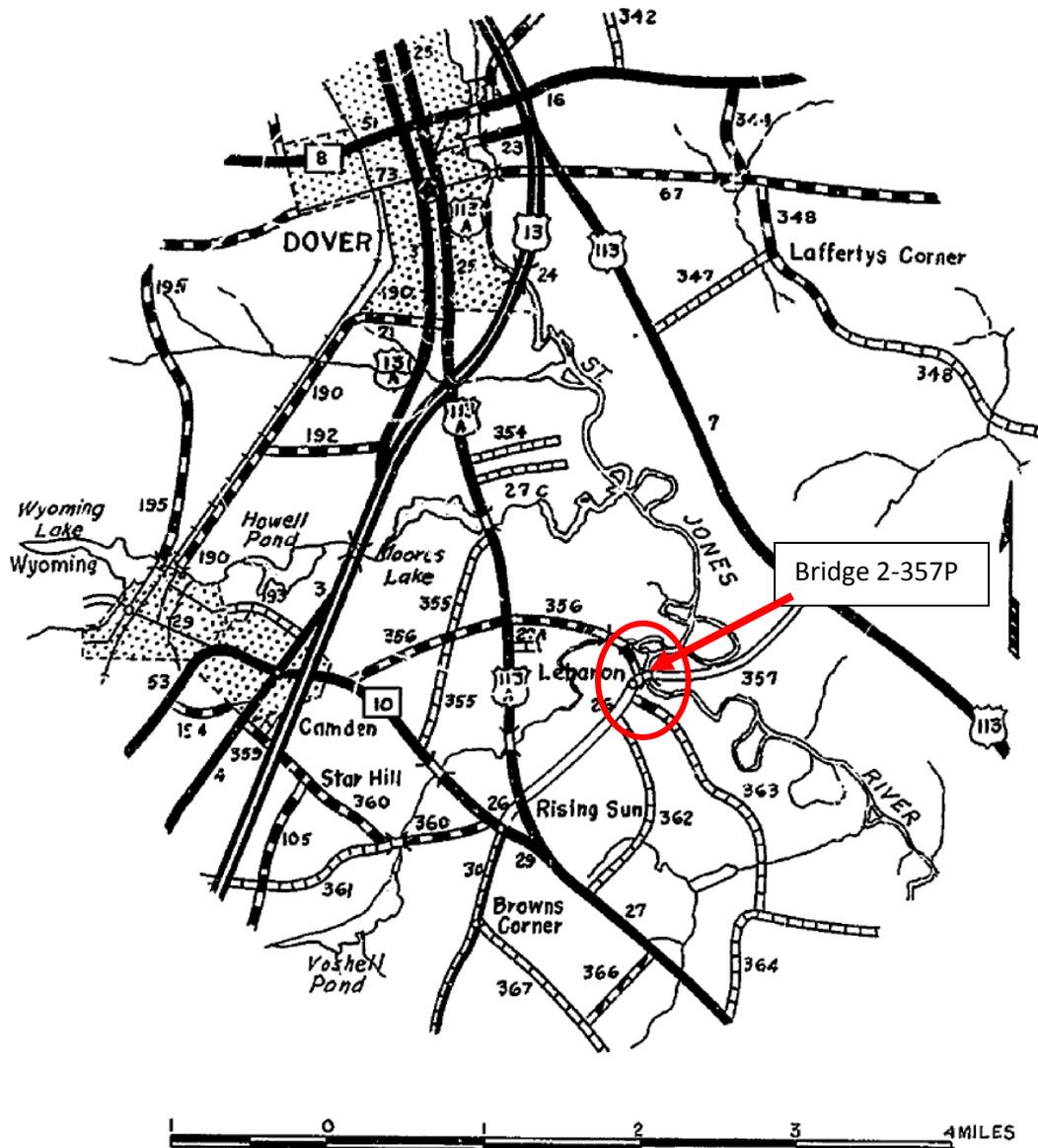
in context with the surroundings, it is another ruin that lacks significance or integrity as part of a former bridge structure. A photographic log of Bridge 2-357P is included at the end of this document.

References

Archaeological and Historical Survey of Lebanon and Forest Landing Road 356a North Murderkill Hundred Kent County, Delaware, 1989; by Heite Consulting, Camden, Delaware



Figure 1. Location Map

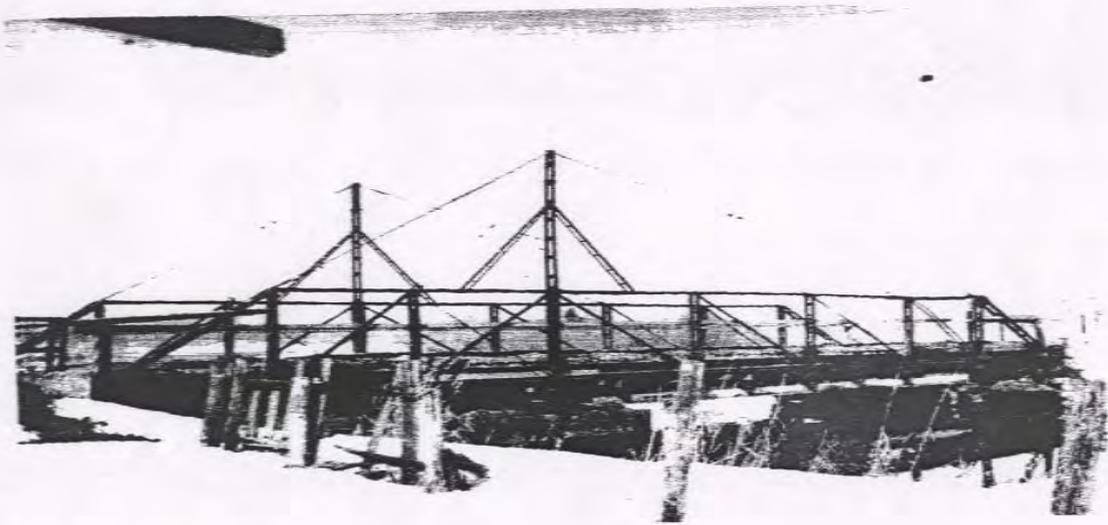


SCALE

Figure 2, Map taken from DelDOT Contract RM 121 circa 1935

Plate 18
View of the old Lebanon swing bridge, circa 1964

Delaware Department of Transportation file photo



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Figure 3. Photo of former swing bridge at this location

Photographic Log



Photo 1. West end cribbing and timber piers that lie atop



Photo 2. Portion of west embankment end



Photo 3. Section of pedestrian bridge east end



Photo 4. East end approach and abutment



Photo 5. Superstructure and abutment remains



Photo 6. Piers (right) attached to the abutment



Photo 7 East substructure detail



Photo 8. West end looking east



Photo 9. Deck profile and railing



Photo 10. East end



Photo 11. Detail of deterioration and section loss

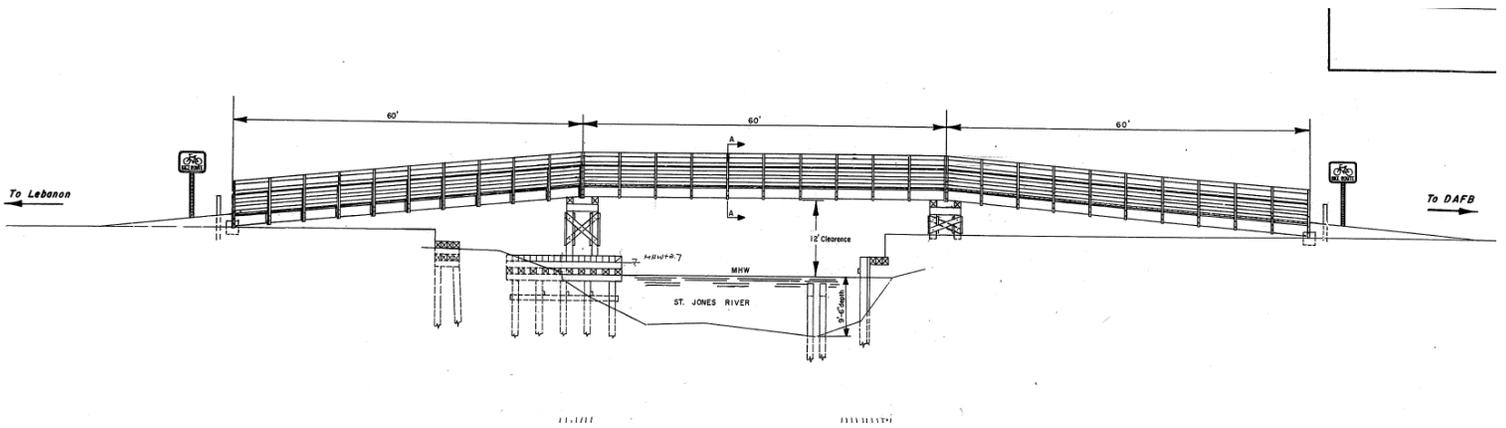


Photo 12. Concept Profile taken from 76-07-012



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CULTURAL RESOURCE SURVEY
STRUCTURE (BRIDGE) FORM

CRS # K05498

- 1. **BRIDGE NUMBER:** 2-357P **OWNER:** State of Delaware
- 2. **LOCATION:** Kent County, Delaware, south of road 356 (Lebanon Road)
ROAD NUMBER: 2-357 **MILEPOST:** unk
FACILITY CARRIED: 2-357P over the St. Jones River
NAME OF FEATURE INTERSECTED: Road 357 (Old Lebanon Road intersects at the west with Lebanon Road (356) and at the east end Old Lebanon Road (357) intersects with Bay Road (State Route 1).

- 3. **TYPE:** swing bridge with pedestrian foot bridge attached **DESIGN:** A two-girder steel I-beam superstructure with timber decking/rails, timber piles, and a stone/concrete foundation with a timber pedestrain bridge attached

MATERIAL: steel, concrete, stone and timbers

OF SPANS: 1 **LENGTH:** UKN **WIDTH:** 20 feet abutment

- 4. **YEAR OF CONSTRUCTION:** 1880 **ALTERATION:** 3 **SOURCE:** 1989 research
DESIGNER/BUILDER: unk, State of Delaware

- 5. **SETTING:** wooded area

- 6. **CURRENT NR STATUS:** **Listed:** **Not Listed:**

NR RECOMMENDATION: **Eligible:** **Not Eligible:**

SUMMARY: Bridge 2- 357P is evaluated for the National Register of Historic Places as part of a circa 1880 pivot swing bridge with several alterations. These include a 1911 reconstruction of the east abutment. Undocumented, but most likely, the stone abutments on the east end were reconstructed again as part of repairs in 1976 with the construction of the pedestrian/bike crossing. More recent timber cribbing were replaced at the western abutments, but this reconstructed pier is where the former swing pivot existed. Timber piles and cribbing below and in the waterway is likely original. In addition, with preparation for the 1976 crossing, either end of the abandoned section had been altered since new footer pads had to be constructed to support the new elevation of the piles. Based on lack of significance and integrity, Bridge 2-357P is not eligible for listing on the National Register of Historic Places. This includes any of the past structural components that might remain as part of structure.

7. REVIEWED BY:

DATE:

8. **PHYSICAL DESCRIPTION:** The structure is a two-girder steel I-beam superstructure with timber decking. Timber cross bent piles is situated at either end of the former bridge abutment. The remains are part of a stone/concrete foundation present at the east end. The remains are part of a stone abutment that has fallen apart and mortar does not exist between stones. The stones appear to have been patched or bonded together by concrete, which has also fallen apart and is in a state of disrepair. Our research did not produce a date for the construction of the timber decking system at the western timber pier but the structure is not original. However many underlying timbers within the cribbing system may date to circa 1880.
9. **SUMMARY OF ALTERATIONS OR MODIFICATIONS:** The west abutment timber pier is circa 1880 (if anything is really present or original); the east stone/concrete abutment is circa 1911; and concrete approach slabs circa 1935. The three span, two girder timber deck with piles and piers was added in 1976.
10. **HISTORICAL AND TECHNOLOGICAL SIGNIFICANCE:** The remnant of the stone abutments or timber piles at either end of the bridge is not a significant example of what remains as part of a former swing bridge. The remaining east end lacks integrity of design and association as a former bridge crossing or even as part of a current pedestrian/bike crossing. The bridge (2-357P) is a common example of this type and does not exhibit any outstanding features or engineering accomplishments.
11. **SOURCES:** Archaeological and Historical Survey of Lebanon and Forest Landing Delaware Department of Transportation Archaeology Series number 70; 1989, Historic Maps, State Contracts 76-07-012, RM 121 and 85-072-02.



CULTURAL RESOURCE SURVEY
DIGITAL PHOTOGRAPHS FORM

CRS # K05498

Date 6/5/2014 Surveyor/Photographer Nathaniel Delesline and Michael C. Hahn

Insert photographs; note file name and brief description of view:
(size photograph 3" on longest side; MAINTAIN ASPECT RATIO – DO NOT STRETCH PHOTO) Photo: 1. West end cribbing and timber piers, Photo: 2. Portion of west end embankment, Photo: 3. Section of pedestrian bridge east end, 4. East end approach and abutment.

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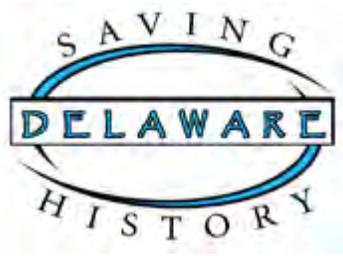


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CULTURAL RESOURCE SURVEY
DIGITAL PHOTOGRAPHS FORM

CRS # K0598

Date 6/5/2014 Surveyor/Photographer Nathaniel Delesline and Michael Hahn

Insert photographs; note file name and brief description of view:
(size photograph 3" on longest side; MAINTAIN ASPECT RATIO – DO NOT STRETCH PHOTO) Photo: 5.
Superstructure and abutment remains, Photo: 6. Piers (right) attached to the abutment, 7. East substructure
detail, Photo: 8. West end looking east.

5.



6.



7.



8.





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CULTURAL RESOURCE SURVEY
DIGITAL PHOTOGRAPHS FORM

CRS # K0598

Date 6/5/2014 Surveyor/Photographer Nathaniel Delesline and Michael Hahn

Insert photographs; note file name and brief description of view:
(size photograph 3" on longest side; MAINTAIN ASPECT RATIO – DO NOT STRETCH PHOTO)
Photo: 9 deck profile railing, 10. East end abutment, 11. Detail of deterioration.

9.



10.



11.

