

# CULTURAL RESOURCES SURVEY & EVALUATION

## *PYLES FORD ROAD (ROAD 239) CULVERTS*

Prepared for: Environmental Studies Section  
Delaware Dept. of Transportation

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## Management Summary

The cultural resources survey and eligibility evaluation of two culverts on Pyles Ford Road (Road 239) over Wilson Run, near Centerville, New Castle County (Figure 1) was completed by Lichtenstein Consulting Engineers, Inc., to facilitate the Section 106 consultation process and support the planning of proposed improvements by the Delaware Department of Transportation (DelDOT). The scope of work included field inspection, background research, completion of Delaware State Historic Preservation Office forms (Appendix A), and National Register eligibility recommendations.

The two culverts are approximately one-fifth mile apart and are (northeast to southwest):

- An 1817 stone culvert with triangular-shaped opening (CRS# N-4283)(Figure 2).
- A ca. 1910 concrete slab culvert (CRS# N-13673) (Figure 3).

The 1817 stone culvert with the triangular-shaped opening is a rare and unexpected form of very short span. Typically stone culverts have either arch-shaped openings or are rectilinear post-and-lintel forms. This is the only known example of a triangular-shaped culvert in Delaware, and could quite likely be the only example in the United States. It is a very archaic, basic form of corbeled construction that can be traced at least as far back as ancient Mycenaean culture in Greece (1,300 B.C.), but it was superseded by more evolved forms, particularly arches during Roman times, and it is virtually unknown in post-Medieval Europe and North America. The culvert's primary significance is as an artifact – in fact the only source of information – that this form of simple construction remained in use as late as the early 19th century. As such, the culvert is judged to meet the National Register Criterion D, which is generally interpreted to refer to archaeological resources, but it can also apply to structures and objects that contain important information if they are the *principal* source of that information. Interpretation of the culvert is open to speculation due to the lack of primary sources, but the best current interpretation based on engineering judgement is that this was a site-specific solution to a short-span drainage structure on a curved roadway without resorting to the more technically demanding construction of a skewed arch, which would have required formwork and abutments. The 1817 stone culvert is recommended eligible under Criterion D.

The ca. 1910 concrete slab culvert is a historically undistinguished example of a very common culvert/bridge type that does not have integrity of original design due to loss of its railings and wingwalls. It is recommended not eligible.

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## **Introduction**

The cultural resources survey and evaluation of two culverts on Pyles Ford Road (Road 239) in New Castle County, Delaware, was completed by Lichtenstein Consulting Engineers, Inc. (LCE), under subcontract with Hunter Research, Inc., for the Location & Environmental Studies Section of the Delaware Department of Transportation (DeDOT) in May 2007. The scope of work included field survey, background research, completion of Delaware State Historic Preservation Office (SHPO) cultural resources survey forms (Appendix A), and National Register eligibility recommendations. The culvert evaluations will be used to facilitate the Section 106 consultation process and support planning of a DeDOT transportation improvement project. Following SHPO review and concurrence with the eligibility recommendations (letter of June 29, 2007), the report was finalized and SHPO comments incorporated in April 2008.

The work was undertaken in accordance with DeDOT's responsibilities under Section 106 of the National Historic Preservation Act of 1966 (as amended) and in accordance with the SHPO's *Survey Forms Instructions and Data Coordination Guidance and Guidelines for Architectural and Archaeological Surveys in Delaware*. The work was completed by historians Patrick Harshbarger (M.A.) and Mary McCahon (M.A.). Both meet the *Secretary of Interior's Professional Qualification Standards for Architectural History/History*.

## **Location and Setting**

The two culverts are located on Pyles Ford Road east of the intersection with DE 52 (Kennett Pike) in the vicinity of the unincorporated village of Centerville in Christiana Hundred (Figure 1: USGS Quad Location Map). Pyles Ford Road has an approximately 18'-wide bituminous-surface roadway and traverses a wooded setting of rolling hills in the Piedmont zone. The culverts carry Pyles Ford Road over two arms of Wilson Run, a stream that rises in the hills near Centerville and flows southeast to the Brandywine River at Rockland. The culverts are separated by about one-fifth mile. The northeastern-most culvert, which is dated to 1817, is a stone culvert with a triangular-shaped opening (Figure 2). The southwestern-most culvert is a ca. 1910 concrete slab on stone abutments (Figure 3). The survey area was less than one acre.

Pyles Ford Road is the northern boundary of the Winterthur Museum & Gardens (NR Listed). The area adjacent to the road within the Winterthur boundaries is undeveloped with wooded lots, meadows, and a pond (Figure 4). The main museum buildings and gardens are located approximately ½ mile to the south and they are not visible from Pyles Ford Road. To the north side of Pyles Ford Road, opposite Winterthur, is a modern residential subdivision (Figure 5). These are large houses on generous-sized lots. A wooded buffer has been maintained between the road and the development. There are no buildings or structures adjacent to the culverts.

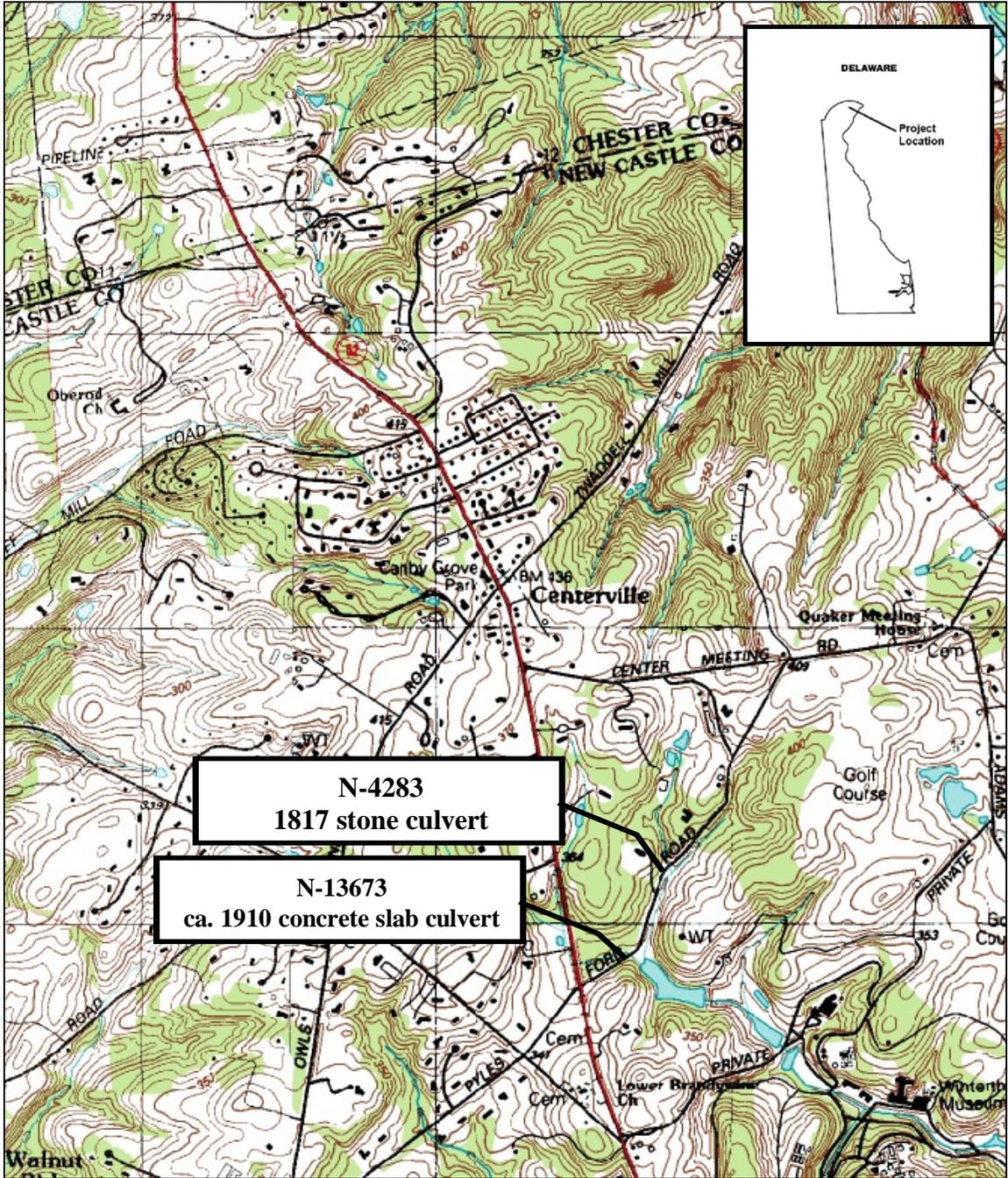


Figure 1. Location map. Culverts on Pyles Ford Road over Wilson Run. USGS Quad: North Wilmington. Scale: 1:24,000.



Figure 2. Stone culvert with triangular-shaped opening, built in 1817. Downstream elevation.



Figure 3. Concrete slab culvert, built ca. 1910. Upstream elevation.



Figure 4. Looking southeast from the stone culvert toward the Winterthur Museum & Gardens grounds. The culvert's parapet is in the foreground.



Figure 5. From the stone culvert looking northwest toward woods and modern residential development beyond.

## Methodology

Field work included an examination of each culvert with basic measurements and sketch plans, 35mm black-and-white photography, and color digital photography.

DelDOT has no original plans for the culverts. State bridge maintenance files have no information on history of construction, alterations, or repairs.

Background research included a review of the appropriate state historic contexts as identified in David L. Ames, et. al. *Delaware Comprehensive Historic Preservation Plan* (1989) and Herman, Siders, and Ames, *Historic Context, Master Reference and Summary* (1989). The culverts are associated with the theme of transportation & communication and property type of bridges as identified in the state plan. The first of the culverts (1817) belongs to the early industrialization period (1770-1830) and the other culvert (ca. 1910) belongs to the urbanization and early suburbanization period (1880-1940). Also consulted were the transportation and bridge technology contexts prepared for DelDOT's statewide historic bridge (Lichtenstein Consulting Engineers, *Delaware's Historic Bridges: Survey and Evaluation with Historic Contexts for Highways and Railroads*, 2000).

Additional research was conducted in the New Castle County road and bridge records at the Delaware Public Archives in Dover and at the Hagley Museum & Library in Wilmington. Other state historic bridge inventories, the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) collection at the Library of Congress, the World Wide Web, and the secondary literature of bridge building were searched for information on other examples of triangular-shaped stone culverts.

National Register eligibility was judged with full consideration to the *National Register Criteria for Evaluation* and guidance.<sup>1</sup> The type-specific criteria used to evaluate the culverts was consistent with that applied to Delaware's historic bridge inventory and defined by the inventory's *Criteria for Determining Significance* (1998), which explains specifically how the criteria and aspect of integrity apply to Delaware's pre-1956 bridge population.

Original survey forms, photos, etc., from this project are on file at the Delaware Department of Transportation, Location & Environmental Studies Section, Dover.

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<sup>1</sup> *How to Apply the National Register Criteria for Evaluation*, National Register Bulletin, Washington, D.C. (1998).

## Previous Survey Data

According to SHPO survey files, the stone culvert was surveyed in 1981 (CRS# N-4283) by the University of Delaware, Civil Engineering Department. As part of this survey, a National Architectural and Engineering Resource card was completed (NAER, a short-lived renaming of HABS/HAER)(see Appendix A for a copy of the card). The 1981 NAER card lists the culvert as State Bridge No. 528, a designation that was used in the early 1980s but that is no longer used by DeIDOT because the culvert is too short to be inventoried.<sup>2</sup>

The NAER card incorrectly identifies the culvert as a stone arch, when in fact it is an archaic form of corbeled construction with a distinctively peaked, triangular-shaped opening. The card also describes the culvert as “the oldest span still functioning in the State,” when in fact there is at least one earlier bridge (State Bridge NC-617, a stone arch built in 1808-11). The culvert was also mapped incorrectly on SHPO Survey Map 08-09-37; it was mapped at the site of the ca. 1910 slab culvert rather than at its actual location about 1/5 mile further to the northeast. [The SHPO map was corrected by Patrick Harshbarger (LCE) and Gwen Davis (SHPO) in April 2007.] The NAER card identifies the culvert as a potentially significant resource.

When DeIDOT conducted its first comprehensive statewide historic bridge inventory in 1988-91, the culvert was included in the survey population but apparently this did not result in the preparation of an updated survey card since there is no record of it at the SHPO or DeIDOT. The culvert continued to be listed as State Bridge No. 528 in the appendix of *Delaware Historic Bridges Survey and Evaluation* (1991) by P. A. Spero & Company and was described as a “2'-9" stone arch culvert” with an unknown date of construction. Spero evaluated the culvert as “compromised, deteriorated” and recommended not eligible. Given that the 1981 NAER card had reported an 1817 date and an unusual and potentially significant form of corbeled construction, this 1991 evaluation of not eligible was not supported by a sufficient level of documentation and justification.

Due to the inconsistencies in the survey data, DeIDOT did not know that the culvert with the triangular-shaped opening had been previously surveyed until brought to their attention in April 2007. DeIDOT and SHPO staff have indicated that the prior evaluation needs to be revisited.

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<sup>2</sup> Michael C. Hahn (DeIDOT). E-mail communication with P. Harshbarger (LCE), May 14, 2007. The culvert has had several numbers. It was labeled County Culvert No. C-85 in the 1920s. It was State Bridge No. 107-A in the 1950s. It was State Bridge No. 528 in the early 1980s. It is too short to have a number in DeIDOT's current inventory system.

The ca. 1910 concrete slab culvert had not been previously surveyed and was assigned a cultural resources survey number in April 2007 as part of the initiation of this project (CRS# N-13673).

### **Historical Background of Pyles Ford Road**

The approximately one-mile-long section of Pyles Ford Road between the Old Kennett Road and Centre Meeting Road was, according to New Castle County Levy Court Records, officially surveyed and laid out as a public road in 1799, although the same records suggest that private property owners had “suffered” the public use of a roadway through their lands for many years previously.<sup>3</sup>

Pyles Ford Road would have been used in the 18th and early 19th centuries by residents of southwestern Christiana Hundred to travel to and from the Centre Friends Meeting. The meeting house is located east of the Pyles Ford Road and Centre Meeting Road intersection, approximately one mile northeast of the culverts. The meeting was established in 1711 in a log building. The present “new” Centre Friends Meeting House is a brick building built to replace the log meeting house in 1796. Improving access to the meeting house was one of the primary reasons a group of local residents petitioned the New Castle County Court of General Sessions to undertake an official survey of the road in 1799. This official survey and its acceptance by the court formalized the road’s status as a public road to be maintained at the county’s expense.<sup>4</sup>

Pyles Ford Road was maintained by the county from 1800 until 1935 when the state legislature transferred all county roads to the jurisdiction of the Delaware State Highway Department (predecessor to DelDOT). Both the 1817 stone culvert and the ca. 1910 concrete culvert date to the pre-1935 period of county jurisdiction when the repair, maintenance, and improvement of roads were routine activities of county governance. Documentation of county road and bridge building activities are fragmentary, and practically non-existent for minor roads and culverts. DelDOT has a collection of New Castle County bridge cards with photos dating to 1921, but little else to document the culverts built by the county prior to 1935. The state highway department has maintained Pyles Ford Road since 1935 but there is no evidence of major improvements, except for regrading and bituminous surface treatment (Figure 6). Pyles Ford Road’s historic context is therefore unexceptional and similar to many roads of a local character in rural areas of the state.

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<sup>3</sup> New Castle County Court of General Sessions, Road Papers, Petitions for Centre Road Past Centre Meeting House to Kennett Road and Centre Meeting House to Centre Road, 1798-99. Delaware Public Archives, Record Group 2805, Series 27.

<sup>4</sup> Ibid.

**Stone Culvert, Built in 1817 (CRS# N-4283)  
Former New Castle County Culvert No. C-85**

Physical Description. The stone culvert is dated to 1817 and was widened to the upstream side with a steel pipe extension prior to 1981. The original stone section has a triangular-shaped opening that measures approximately 30" at the base, 5' in height, and 17' wide (out-to-out) (Figure 7). The stone is a locally quarried gneiss, known as "blue rock" for its dark, grayish-blue appearance. It is the same stone found in many vernacular buildings, walls, and other structures throughout much of northern New Castle County. A May 17, 1921 photo of the culvert (the earliest known photo attached to the county bridge card) shows that the culvert had been coated with a cementitious material sometime in the early 20th century (Figure 8). Some of that coating remains today but most of it has fallen away. The stone parapet remaining on the downstream side has a non-original concrete coping that also dates to before 1921 (Figure 9).<sup>5</sup>

The roughly coursed, corbeled stones forming the triangular opening were worked to provide a relatively uniform triangular-shaped inner surface (Figure 10). The culvert opening (intrados) is not stepped, it is truly triangular in shape. A lintel-like stone much larger than the other stones is located one course above the apex of the triangle (Figure 7). It is presumed that if the fill over the opening were removed that the outer walls (extrados) are stepped. The wingwalls and parapets are of uncoursed fieldstone. The culvert appears to have been built using mortar (it was not dry laid) but the original soft lime-based mortar has completely weathered away.<sup>6</sup>

The triangular-shaped opening is at the junction of the two flared wingwalls. The wingwalls measure approximately 19' long to the east of the opening and 22' to the west of the opening for a total out-to-out length of approximately 41' (as measured along the tops of the parapets on the downstream side). The wingwalls flare at an oblique angle to one another, thus conforming with the curvature of the roadway (Figure 11). The parapet measures approximately 40" high (as measured from the roadway surface to the top of the parapet) and 20" wide. Several generations of repointing are evident, but most of the exposed surfaces on the outside face of the wingwalls have little to no mortar remaining with loose, shifting, or missing stones. The parapet and wingwall at the southeastern corner have failed and collapsed for a length of about 15' (Figure 11)

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<sup>5</sup> New Castle County Bridge Cards, 1921. DelDOT.

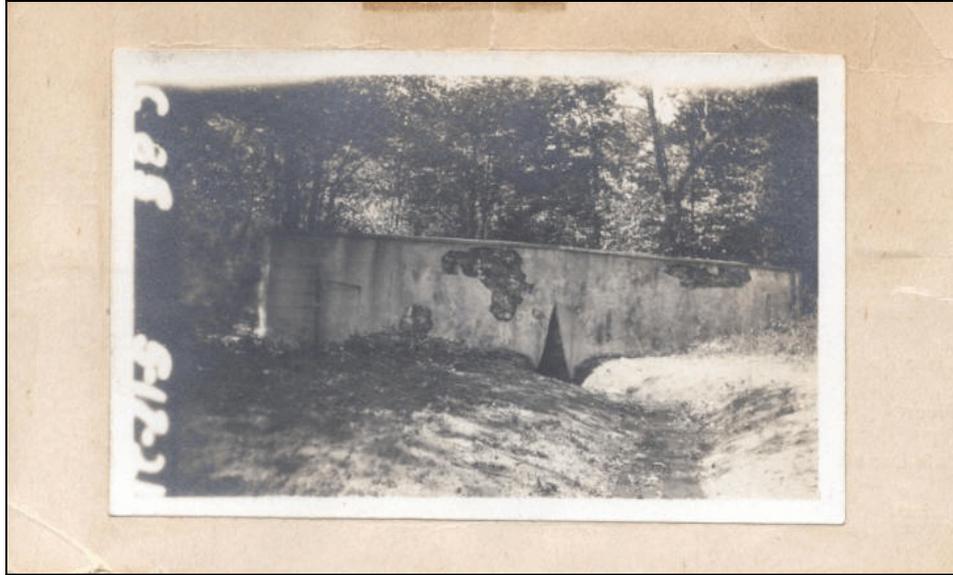
<sup>6</sup> There is no physical evidence (such as keystones, voussoirs, or skewbacks) that the culvert is a poorly reconstructed arch. The triangular-shaped opening is without doubt the original shape.



Figure 6. Pyles Ford Road, looking southwest from the stone culvert.



Figure 7. Detail of culvert opening.



Bridge No.	C-85
Location	Near Centerville
Description	Stone culvert, triangular. Built 1817
Clear Span	3'0"
Abutments	masonry
Floor to W. L	6'8" water 6"
Clear Roadway	14'0"
Floor	road on fill
Safe Load	Indeterminate. C-12
Details	

Figure 8. New Castle County Bridge Card, 1921.



Figure 9. Parapet detail, looking southeast.



Figure 10. Inside the stone culvert looking upstream. Note the pipe placed in the upstream opening.



Figure 11. Oblique view of stone culvert looking west. Note the collapsed parapet and wingwall at the southeast corner.



Figure 12. Upstream elevation. The upstream opening has been covered by debris and silt.

The original culvert had an approximately 14'-wide roadway, but it has been widened to its upstream side with a corrugated-steel pipe culvert to make for an approximately 18'-wide roadway (Figures 10, 12). The 1981 NAER survey reported that the widening was "recent" but does not provide an exact date; there are no available records for the widening at DeIDOT. It is believed that state maintenance forces probably widened the culvert sometime in the 1960s or 1970s to achieve a wider roadway and/or repair the upstream side of the culvert because of a failing parapet or wingwalls. The pipe is set into the upstream side of the triangular opening at a skew. The triangular opening above the pipe has been filled with mortared stone (Figure 10). The pipe is under earth fill that also covers the remains of the stone culvert's upstream side. The original stone parapet on the upstream side is gone; temporary Jersey barriers now serve as the upstream railing (Figure 11).

Historical Context. The earliest documentation for the culvert is a New Castle County bridge card and photo dated May 17, 1921 (Figure 8). That card lists the culvert as county culvert No. C-85, "Stone Culvert, Triangular, Built in 1817." The source of the 1817 date is not documented. The 1981 NAER card also references the county card and adds as a source, "Inscription in stone indicating date of 1817." Unfortunately, the NAER surveyor did not note the inscription's location and didn't photograph it. Field work in 2007 did not locate the inscription or any additional documentation of it. A possibility is that the inscription has been removed, covered by repointing, or lays in the rubble of the southeastern parapet. Inscriptions would have typically been found on the roadway faces of the parapets, usually at one corner or at mid-span. In any event, the 1817 date is appropriate based on the culvert's style. No other evidence withstanding, 1817 is believed to be the correct date.

New Castle County Levy Court road records and minutes for the years 1815 to 1818 were searched for any references to the culvert or work on Pyles Ford Road. Unfortunately, but not surprisingly, these records offered no clues. The levy court frequently issued warrants for bridge and road work, but these warrants to pay builders and materials suppliers rarely specify the type or location of the work, especially for minor structures like culverts.<sup>7</sup>

The head of grounds and landscape at Winterthur Museum & Gardens was contacted. Winterthur has no documentation of the stone culvert or knowledge of culverts like it on their grounds. There is no known historical association between the culverts and the development of Winterthur.<sup>8</sup>

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<sup>7</sup> New Castle County Levy Court, Minutes, 1815-1818. Microfilm. Delaware Public Archives.

<sup>8</sup> Mr. Marlin Dice, Winterthur Museum & Gardens, communication with P. Harshbarger (LCE), Apr. 25, 2007.

DelDOT has no records of any similar culverts with triangular-shaped openings surviving or having existed in the state. The 1921 New Castle County bridge cards illustrate many stone culverts with arched openings, but no triangular openings other than this one.

The tradition of stone construction in America dates to earliest settlement and was transferred here by European colonists. In Europe and in colonial America, the most common forms of short-span construction had arched openings, rectilinear openings (post and lintel), or less frequently corbeled (stepped) openings. A much rarer form of opening was a triangular-shaped opening. The oldest known surviving example in Europe is an example dating to 1,300 B.C. in Greece, built by the Mycenaean culture (Figure 13). Architectural and engineering historians consider this a very basic form of construction, one of the first steps in the evolution of more complex forms, such as the arch. It does not require formwork or the construction of abutments. It is an archaic form of construction that was not widely used in Europe in later periods.<sup>9</sup>



Figure 13. A Mycenaean culvert with triangular-shaped opening near Epidauros, Greece (1,300 B.C.). Source: Scholar Resource Web site.

A review of the secondary literature of American bridge history, including state historic bridge inventories, also indicates that this triangular-shaped opening is rare. There are no similar examples documented in the HABS/HAER collection at the Library of Congress. Nor are there any examples that can be located through a search of Web resources, or mentioned in standard sources on American bridge technology and construction history. A limiting factor in the research is that most state departments of transportation do not comprehensively inventory culverts (defined by the Federal Highway Administration as any bridge with an opening of less than 20'). Maryland and Maine do inventory culverts, and neither of those states, both with traditions of early stone culverts and bridges, have known examples of triangular-shaped openings in their inventories.<sup>10</sup> Although the available data for comparison is not comprehensive or conclusive, Delaware's triangular culvert is without doubt a very rare form.

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<sup>9</sup> Sir Banister Fletcher, *Sir Banister Fletcher's A History of Architecture*, 19th ed. (Boston: Butterworths, 1987); Scholars Resource: Ancient Art: Greek Architecture, on-line at <[www.scholarsresource.com](http://www.scholarsresource.com)> [Apr. 25, 2007].

<sup>10</sup> Lichtenstein Consulting Engineers, *Maine Historic Bridge Inventory*, prepared for the Maine Department of Transportation, 2002; Parsons Brinckerhoff Quade & Douglas, *Small Structures on Maryland's Roadways, Historic Context Report*, Prepared for the Maryland State Highway Administration, 1997.

The lack of documentation makes any interpretation of the culvert speculative. An observation made by LCE professional engineer Michael C. Cuddy is that the topography may have required that the culvert be built on a curve in the road. A triangular shape would definitely have been easier for a less skilled mason to build than a skewed arch, which is more complex and requires formwork and abutment. Thus, this simple culvert could be merely a local solution to a site-specific problem (Figure 14).



Figure 14. The stone culvert is at a curve in the road with the stream's course crossing at a skew. The triangular-shaped opening may have been a site-specific solution avoiding difficulties associated with building an arch.

Another possible speculation is that this triangular form was indeed the preference of a local mason based on some local or regional tradition transferred from Europe and in use in Delaware in the early 19th century and perhaps during the colonial period as well. It is also possible that there were other examples that no longer exist. However, there is no primary evidence other than the culvert itself to support this hypothesis, and a search of available sources did not identify triangular-shaped openings as a variation common to a particular building tradition. This possibility, while not ruled out, seems less likely than the best current interpretation that the triangular-shape opening was a site-specific solution to building a short-span drainage structure on a roadway curve without resorting to the more technically demanding construction of a skewed arch.

National Register Recommendation. The stone culvert's significance is as an archaic, simple, basic form of construction that is quite rare. It can be traced at least as far back as ancient Mycenaean culture in Greece, but the form is virtually unknown in North America. The culvert's primary significance is as an artifact – in fact the only source of information – that this form of simple construction remained in use here as late as the early 19th century.

As such, the culvert is judged to meet the National Register Criterion D, which is generally interpreted to refer to archeological resources, but it can also apply to structures and objects that contain important information if the structure or object is “the *principal* source of important information.”<sup>11</sup> This culvert is the principal source of

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<sup>11</sup> U.S. Dept. of the Interior, National Park Service, National Register Bulletin, How to Apply the National Register Criteria for Evaluation (1998), p. 21.

information that this basic triangular form was used in Delaware, perhaps even in North America. It is also possible that careful deconstruction of the culvert can yield important information, such as confirmation of an inscription or builders' mark, as well as the details of construction that are not visible due to the earth fill. Careful documentation and examination, leading to a better understanding of its use here and at this time, is a legitimate question for scholarly research.<sup>12</sup>

The assessment of integrity under Criterion D requires that the property "remain sufficiently intact to yield the expected important information ..." but it "does not need to recall *visually* an event, person, process, or construction technique." Since it is the triangular-shaped opening that is of importance and remains intact, the culvert possesses integrity under Criterion D.

Criterion C for significance of design and construction is judged to not apply to the culvert since it does not embody the distinctive characteristics of a type, period, or method of construction generally recognized by scholarship as a significant variation in Delaware or American bridge-building history. In fact, this archaic and basic form of construction can well be judged to have had little or no influence on the evolution of culvert design in Delaware or America. It is an ancient and simple form that was superseded in Western culture many centuries prior to its construction in 1817. The National Register guidance states that "A property is not eligible [under Criterion C] simply because it has been identified as the only such property ever fabricated; it must be demonstrated to be significant as well."<sup>13</sup> Significance under Criterion C is judged to mean that the resource in question actually is an important example (within its context) of the building practices of a particular time in history or that it possesses high artistic values. Given the lack of available documentation and the rarity of this form, which is not known as an important variation in stone bridge building practices of the early 19th century, the culvert cannot be judged to meet Criterion C. Additionally, the culvert does not, due to its history of alterations and loss of original fabric from widening and deterioration, meet the generally accepted definitions of integrity of design and material that are so important to bridges or culverts listed under Criterion C.

Based on the information found to date, the culvert is not associated with significant persons or events from history, and thus Criteria A and B do not apply.

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<sup>12</sup> During the 1998 historic bridge inventory update, DelDOT and the SHPO approved *Criteria for Determining Significance* for use with the Delaware statewide historic bridge inventory. This criteria considered the possibility that Criterion D could apply to an unusual and/or technologically significant bridge for which no plans or other documentation survives.

<sup>13</sup> *Ibid.*, p. 18.

**Concrete Slab Culvert, Built ca. 1910 (CRS# N-13673).  
Former New Castle County Culvert No. C-86.**

Physical Description: The skewed, 5'-long (clear span) and approximately 18'-wide, concrete slab culvert is supported on roughly coursed fieldstone abutments (Figures 3, 15). The culvert has lost its original railings, which consisted of two-high steel pipes over the opening and concrete parapets over the wingwalls as shown by the New Castle County bridge card photo dated May 17, 1921. A section of the pipe railing and parapet is still visible where it fell downstream of the culvert (Figures 16-17). A modern steel beam guide rail has been added to the south elevation, but there is currently no railing on the north elevation. The 8"-deep concrete slab is spalled at its fascia with no visible reinforcing bars; it is presumed that the slab, given its short length, is probably un-reinforced. The stone abutments and wingwalls have been undermined at all four corners and have partially collapsed.

Historical Context. DeIDOT has no plans for the culvert and no documentation for its date of construction. It is dated ca. 1910 based on style and that it was in place by 1921 as documented by a New Castle County bridge card. The card lists it as county culvert No. C-86, but does not provide a date of construction.

The concrete slab type developed along with the expanded use of concrete as a building material during the late 19th century. It proved ideally suited to short-span highway culverts and bridges (from a few feet up to 30' long) due to its ease of design and construction, strength, and low maintenance. It was also easily standardized allowing engineers to efficiently prepare plans and specifications that could be quickly adapted to many site conditions. Slab bridges and culverts were coming into ever increasing use in Delaware and nationally by 1910. State and county engineers throughout Delaware and the nation made widespread use of the slab type; literally thousands of examples were built with a variety of common railing treatments from parapets to pipe rails. Slabs culverts continued to be built throughout the 20th century.

The Delaware state historic bridge inventory has previously identified several complete and distinguished examples of the slab type within the county and state contexts. These tend to be the longer or more aesthetic examples, as well as those exhibiting important refinements in design, such as the application of continuous, variable-depth slabs or composite decks. The ca. 1910 slab culvert is not historically distinguished in comparison with the statewide population of similar resources.<sup>14</sup>

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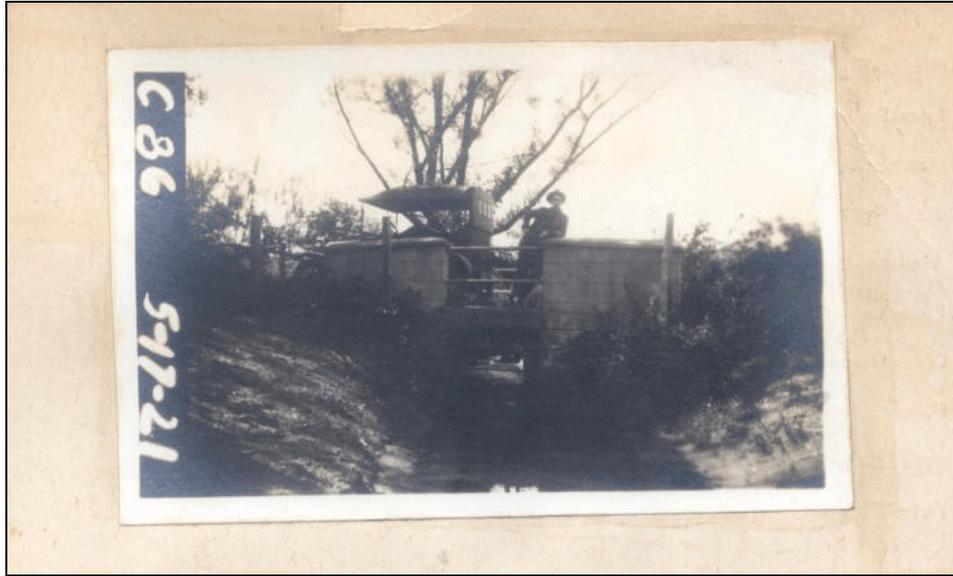
<sup>14</sup> For example, State Bridge NC-76, ca. 1915. See Delaware's Historic Bridges, pp. 189-215.



Figure 15. Concrete slab culvert on stone abutments. Note the undermined abutment (left) and failed and shifted abutment corner (right). Looking upstream.



Figure 16. Oblique view of slab culvert, downstream side looking west. Note the section of concrete parapet laying on its side.



Bridge No.	C-86
Location	near Centerville
Description	culvert, conc. slab & walls, pipe rail
Clear Span	5' 0"
Abutments	masonry
Floor to W. L.	3' 9"      water 6"
Clear Roadway	about 16' 0"
Floor	road surface
Safe Load	<i>Indeterminate</i>
Details	<i>None.</i>

Figure 17. New Castle County Bridge Card, 1921.

National Register Recommendation: The ca. 1910 concrete slab culvert has no distinguishing features or details. It does not have integrity of original design due to loss of the original railings. It is an altered example of a very common 20th-century bridge/culvert type. It is not historically significant for its technology or context.

### **Summary of Recommendations**

National Register Eligibility. The 1817 stone culvert with the triangular-shaped opening on Pyles Ford Road over Wilson Run (N-4283) is recommended eligible under Criterion D as the principal source of important information on an archaic and basic form of construction. It is the only known example of this form in the state, and perhaps within the region or nation as a whole. Other than a 1921 New Castle County bridge card and a 1981 NAER card, there is no documentation for this resource. Interpretation of the culvert is speculative due to the lack of primary sources, but the best current interpretation is that this was a site-specific solution to building a short-span drainage structure on a curved roadway without resorting to the more technically demanding construction of a skewed arch.

The ca. 1910 concrete slab culvert (N-13673) is recommended not eligible as an undistinguished and altered example of its type.

Recommended Changes to Historic Contexts and Planning Goals/Priorities of State Preservation Plan. A recommendation of this report is to consider updating DeIDOT's historic bridge inventory contexts to explicitly cover the topic of culverts. This effort would be geared toward clearly defining culverts as a subset of bridges and identifying the culvert designs that have potential significance from the vast majority that don't have significance. Most culverts, such as the ca. 1910 slab culvert on Pyles Ford Road, are undistinguished examples of technologies already addressed by the historic bridge inventory contexts. There are some few culvert designs, like pipes or short-span stone culverts, that are not currently addressed by the contexts. The goal would be to define and have agreement on which culvert designs are not significant and which have potential significance to expedite project review.

Assessing Effects and Potential Treatments. DeIDOT has indicated that the Pyles Ford Road improvement project is still in the scoping phase and a preferred alternative has not been identified. It has however requested some preliminary recommendations given the unusual nature of the stone culvert with the triangular-shaped opening.

The culvert's deteriorated condition and environment, including poor alignment and location in a setting with increasing development pressures, threatens its survival. Currently, it is possible to pull stones out of the culvert walls by hand and it will not take much to further collapse them. It is believed that the weakened southeastern wingwall

and parapet were ultimately lost to impact damage from a motor vehicle. In addition to poor geometry and physical condition, the culvert's upstream side is clogged with heavy debris and silt, suggestive that the current opening has become inadequate to the hydraulics of the site.

If the culvert is replaced, it will be an adverse effect. Given that the culvert is being recommended eligible under Criterion D, there is justification to approaching the culvert as an archaeological resource. When archaeological sites cannot be left undisturbed, data recovery is the goal for mitigating effects. Such data recovery from the culvert would likely include the following items:

- Removing the roadway fill from the culvert to allow for complete examination and documentation of the extrados, upstream walls, and construction technique. This should be done with the assistance of a backhoe operator experienced with this type of archaeological work. Documentation should include photography and measured drawings.
- A thorough search should be made for the missing inscription stone. The inscription was referenced but not adequately documented by a cultural resources survey of the culvert in 1981. This may include looking among the loose stones that have fallen from the bridge and checking with state maintenance crews to determine if the stone happens to be stored off-site. Removal of the overburden may also reveal the stone, especially if it is located near the parapet's roadway level and has been covered over by pavement.

## **Bibliography**

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Delaware State Historic Preservation Office. CRS# N-4283. Pyles Ford Road, Wilson Run Culvert. National Architecture and Engineering Record Card, 1981. On-file at the Delaware State Historic Preservation Office, Dover, Delaware.

Fletcher, Sir Banister. Sir Banister Fletcher's A History of Architecture. 19th ed. Boston: Butterworths, 1987.

Herman, Bernard L., Rebecca J. Siders, David L. Ames, and Mary Helen Callahan. Historic Context, Master Reference and Summary. Center for Historic Architecture and Engineering, College of Urban Affairs and Public Policy, University of Delaware, Newark, Delaware, June 1989

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New Castle County General Court. Road Papers. 1790-1820. Record Group 2805, Series 27. Delaware Public Archives, Dover.

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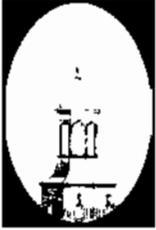
P. A. Spero & Company. Delaware Historic Bridges Survey and Evaluation. Dover: Delaware Department of Transportation, Historic Architecture and Engineering Series No. 89. 1991.

Parsons Brinckerhoff Quade & Douglas. "Small Structures on Maryland's Roadways, Historic Context Report." Annapolis: Maryland State Highway Administration, 1997.

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## APPENDIX A

# SHPO CULTURAL RESOURCE SURVEY FORMS



DELAWARE STATE HISTORIC PRESERVATION OFFICE  
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY  
PROPERTY IDENTIFICATION FORM

CRS # N-4283  
SPO Map 08-09-37  
Hundred Christiana  
Quad Wilmington North  
Other \_\_\_\_\_

1. HISTORIC NAME/FUNCTION: Colvert
2. ADDRESS/LOCATION: Pyles Ford Road x Wilson Run Tributary
3. TOWN/NEAREST TOWN: Centerville vicinity?
4. MAIN TYPE OF RESOURCE:
 

building	<input type="checkbox"/>	structure	<input checked="" type="checkbox"/>	site	<input type="checkbox"/>	object	<input type="checkbox"/>
landscape	<input type="checkbox"/>	district	<input type="checkbox"/>				
5. MAIN FUNCTION OF PROPERTY: Colvert
6. PROJECT TITLE/ REASON FOR SURVEY (if applicable):  
Pyles Ford Road improvements (DelDOT)

7. ADDITIONAL FORMS USED:

#:	Form:	List property types:
	CRS 2 Main Building Form	
	CRS 3 Secondary Building Form	
	CRS 4 Archaeological Site Form	
	CRS 5 Structure (Building-Like) Form	
	CRS 6 Structure (Land Feature) Form	
	CRS 7 Object Form	
	CRS 8 Landscape Elements Form	
<input checked="" type="checkbox"/>	CRS 9 Map Form	N/A
	CRS 14 Potential District Form	
<input checked="" type="checkbox"/>	<u>BRIDGE/CULVERT</u>	

8. SURVEYOR INFORMATION:

Surveyor name: Patrick Harshbarger

Principal Investigator name: "

Principal Investigator signature: *CP Huselberg*

Organization: Lichtenstein Consulting Engineers Date: 5-1-07

9. OTHER NOTES OR OBSERVATIONS:

CRS# N-4283

This form is to update the NAER card dated 1981.

10. STATE HISTORIC CONTEXT FRAMEWORK (check all appropriate boxes; refer to state management plan(s)):

a) Time period(s)

- Pre-European Contact
- Paleo-Indian
- Archaic
- Woodland I
- Woodland II

- 1600-1750∇ Contact Period (Native American)
- 1630-1730∇ Exploration and Frontier Settlement
- 1730-1770∇ Intensified and Durable Occupation
- 1770-1830∇ Early Industrialization
- 1830-1880∇ Industrialization and Early Urbanization
- 1880-1940∇ Urbanization and Early Suburbanization
- 1940-1960∇ Suburbanization and Early Ex-urbanization

b) Geographical zone

- Piedmont
- Upper Peninsula
- Lower Peninsula/Cypress Swamp
- Coastal
- Urban (City of Wilmington)

c) Historic period theme(s)

- |  |  |
|--|--|
| <input type="checkbox"/> Agriculture           | <input checked="" type="checkbox"/> Transportation and Communication   |
| <input type="checkbox"/> Forestry              | <input type="checkbox"/> Settlement Patterns and Demographic Changes   |
| <input type="checkbox"/> Trapping/Hunting      | <input type="checkbox"/> Architecture, Engineering and Decorative Arts |
| <input type="checkbox"/> Mining/Quarrying      | <input type="checkbox"/> Government                                    |
| <input type="checkbox"/> Fishing/Oystering     | <input type="checkbox"/> Religion                                      |
| <input type="checkbox"/> Manufacturing         | <input type="checkbox"/> Education                                     |
| <input type="checkbox"/> Retailing/Wholesaling | <input type="checkbox"/> Community Organizations                       |
| <input type="checkbox"/> Finance               | <input type="checkbox"/> Occupational Organizations                    |
| <input type="checkbox"/> Professional Services | <input type="checkbox"/> Major Families, Individuals and Events        |

USE BLACK INK ONLY



CULTURAL RESOURCE SURVEY  
MAP FORM

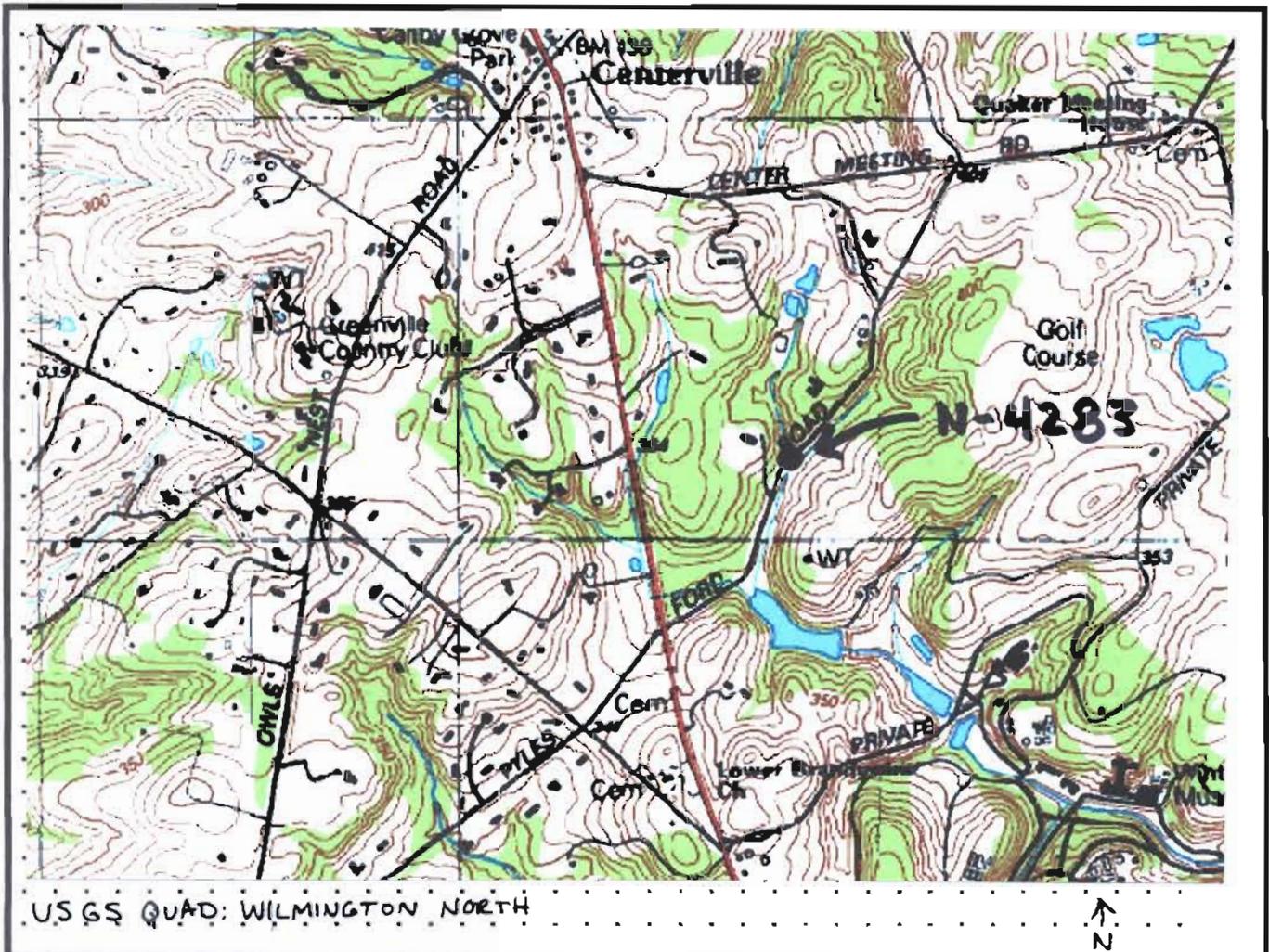
CRS # N-4283

1. ADDRESS/LOCATION: PYLES FORD ROAD x WILSON RUN TRIBUTARY
2. NOT FOR PUBLICATION  reason: \_\_\_\_\_
3. LOCATION MAP:

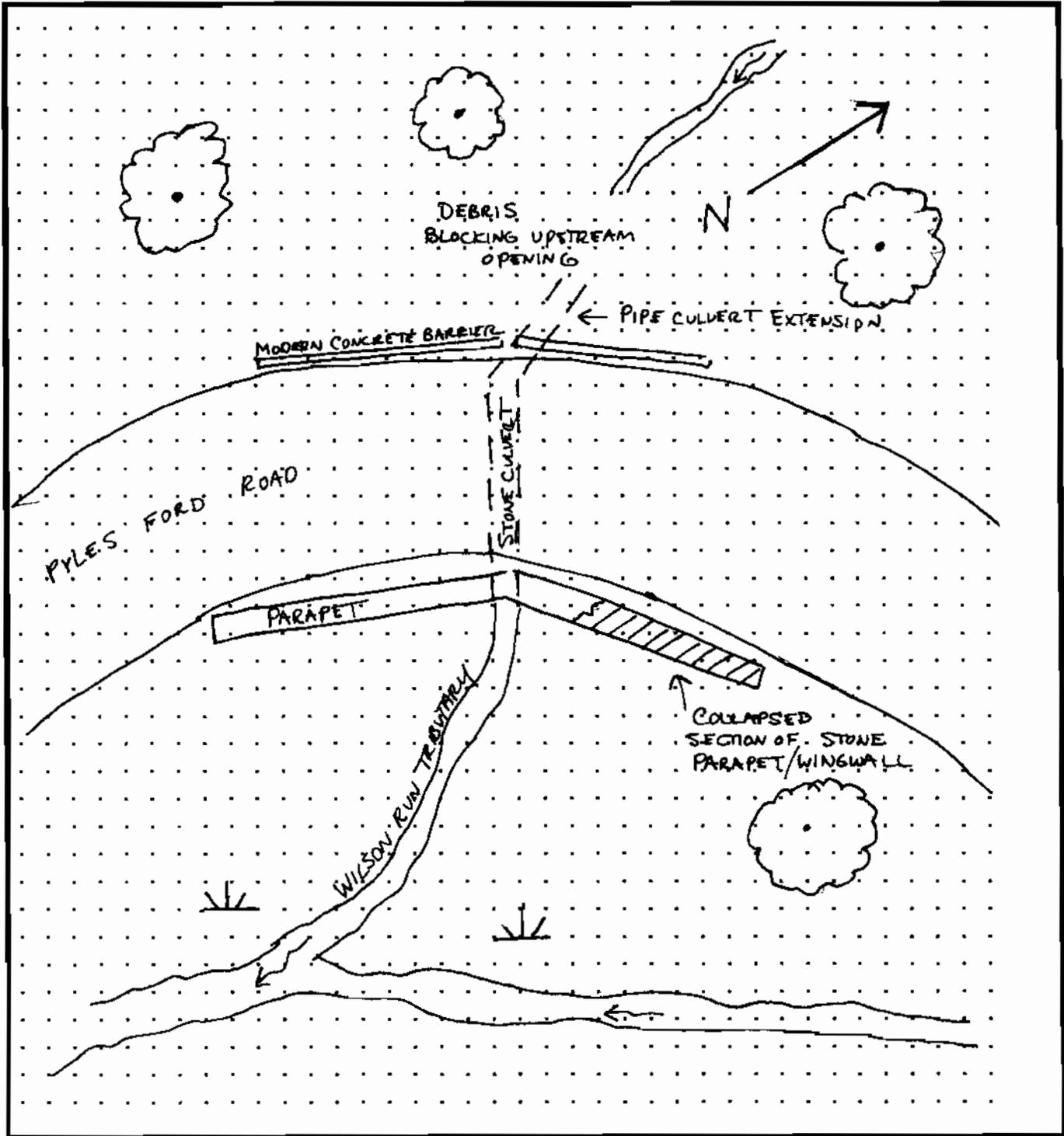
Indicate position of resource in relation to geographical landmarks such as streams and crossroads.

(attach section of USGS quad map with location marked or draw location map )

INDICATE NORTH ON SKETCH



INDICATE NORTH ON PLAN



USE BLACK INK ONLY



DELAWARE STATE HISTORIC PRESERVATION OFFICE  
21 THE GREEN, SUITE A, DOVER, DE 19901

CULTURAL RESOURCE SURVEY  
STRUCTURE – BRIDGE/CULVERT  
DRAFT FORM

CRS #	N-4283
SPO Map	08-09-37
Hundred	Christiana
Quad	Wilmington North
Other	

BRIDGE NUMBER: None                      OWNER: State                      CRS#: N-4283  
 COUNTY: New Castle                      HUNDRED: Christiana                      ZONE: Piedmont  
 LOCATION: Approx. 1,300' E of DE 52                      SPO MAP: 08-09-37  
 ROAD NUMBER: Road 239                      MILEPOST:                      USGS QUAD: Wilmington North

FACILITY CARRIED: Pyles Ford Road  
 NAME/FEATURE INTERSECTED: Wilson Run Tributary

TYPE: Culvert                      DESIGN: Triangular  
 MATERIAL: Stone  
 # OF SPANS: 1                      LENGTH: 30 in.                      WIDTH: 18 ft.  
 DATE OF CONSTRUCTION: 1817                      ALTERATION: Pre-1921, Pre-1981                      SOURCE: Style/NCC Bridge Card  
 DESIGNER/BUILDER: Unknown

**SETTING:** The culvert carries a 2-lane road over a stream in a wooded setting. The road is the northern boundary of the Winterthur Museum & Gardens. Beyond the low-lying wooded area to the bridge's south is a large meadow, which is part of the garden, but not an area that is regularly accessed by the public. The culvert's northern quadrants are wooded. Beyond the northwest quadrant is a modern residential subdivision.

**CURRENT NR STATUS:** Not Previously Evaluated

**NR RECOMMENDATION:** Eligible

**SUMMARY:** The stone culvert's distinguishing feature is a triangular-shaped opening, a rare and unexpected form of very short span. This is an archaic and basic form of construction, with roots in ancient times, but documentation of its use in America, even in the pre-industrial era, is practically unknown. Other than the culvert itself, there is no primary documentation for this culvert or this simple form of culvert's use in Delaware.

PHOTO: Roll 1: 8-19                      REVIEWED BY: P. Harshbarger                      DATE: May 2007

doc# \_\_\_\_\_

USE BLACK INK ONLY

CRS-

**NAME/LOCATION/DATE OF CONSTRUCTION:** Culvert, Pyles Ford Road over Wilson Run Tributary, 1817

**Physical Description:** The stone culvert is dated to 1817 and was widened to the upstream side with a steel pipe extension prior to 1981. The original stone section has a triangular-shaped opening that measures approximately 30" at the base, 5' in height, and 17' wide (out-to-out). The stone is a locally quarried gneiss, known as "blue rock" for its dark, grayish-blue appearance. It is the same stone found in many vernacular buildings, walls, and other structures throughout much of northern New Castle County.

The roughly coursed, corbeled stones forming the triangular opening were worked to provide a relatively uniform triangular-shaped inner surface. The culvert opening (intrados) is not stepped, it is truly triangular in shape. A lintel-like stone much larger than the other stones is located one course above the apex of the triangle. It is presumed that if the fill over the opening were removed that the outer walls (extrados) are stepped. The wingwalls and parapets are of uncoursed fieldstone. The culvert appears to have been built using mortar (it was not dry laid) but the original soft lime-based mortar has completely weathered away.

The triangular-shaped opening is at the junction of the two flared wingwalls. The wingwalls measure approximately 19' long to the east of the opening and 22' to the west of the opening for a total out-to-out length of approximately 41' (as measured along the tops of the parapets on the downstream side). The wingwalls flare at an oblique angle to one another, thus conforming with the curvature of the roadway. The parapet measures approximately 40" high (as measured from the roadway surface to the top of the parapet) and 20" wide. Several generations of repointing are evident, but most of the exposed surfaces on the outside face of the wingwalls have little to no mortar remaining with loose, shifting, or missing stones. The parapet and wingwall at the southeastern corner have failed and collapsed for a length of about 15'.

**Summary of Alterations/Modifications:** The 1817 stone culvert is visible only from the downstream (south) elevation. The original culvert had an approximately 14' wide roadway, but it was widened to its upstream side with a corrugated-steel pipe culvert to make for an approximately 18' wide roadway prior to 1981. The pipe is set into the upstream side of the triangular opening with the opening above the pipe filled in with masonry. The pipe was placed under earth fill that totally obscures whatever remains of the upstream side of the stone culvert. The upstream stone parapet was likely removed at about the same time. Temporary concrete barriers now serve as the railing on the upstream side.

A New Castle County bridge card photo dating to 1921 shows that the stone culvert had been coated with a cementitious material prior to that date, but today much of that coating has fallen away. The stone parapet remaining on the downstream side has a non-original concrete coping that also dates to before 1921.

**Historical and Technological Significance:** The earliest documentation for the culvert is a New Castle County bridge card and photo dated May 17, 1921. That card lists the culvert as county culvert No. C-85, "Stone Culvert, Triangular, Built in 1817." The source of the 1817 date is not documented. The 1981 NAER card (SHPO Survey File) also references the county card and adds as a source, "Inscription in stone indicating date of 1817." Unfortunately, the NAER surveyor did not note the inscription's location and didn't photograph it. Field work in 2007 did not locate the inscription. A possibility is that the inscription has been removed, covered by repointing, or lays in the rubble of the southeastern parapet. Inscriptions would have typically been found on the roadway faces of the parapets, usually at one corner or at mid-span. In any event, the 1817 date is appropriate based on the culvert's style. No other evidence withstanding, 1817 is believed to be the correct date.

New Castle County Levy Court road records and minutes for the years 1815 to 1818 were searched for any references to the culvert or work on Pyles Ford Road. Unfortunately, but not surprisingly, these records offered no clues. The levy court frequently issued warrants for bridge and road work, but these warrants to pay builders and materials suppliers rarely specify the type or location of the work, especially for minor structures like culverts.

DelDOT has no records of similar culverts with triangular-shaped openings surviving or having existed in the state. The 1921 New Castle County bridge cards illustrate many stone culverts with arched openings, but no triangular openings other than this one.

The tradition of stone construction in America dates to earliest settlement and was transferred here by European colonists. In Europe and America, the most common forms of short-span stone construction had arched openings, rectilinear openings (post and lintel), or less frequently corbeled (stepped) openings. A much rarer form of opening was a triangular-shaped opening. The oldest known surviving example in Europe is an example dating to 1,300 B.C. in Greece, built by the Mycenaean culture. Architectural and engineering historians consider this a very basic form of construction, one of the first steps in the evolution of more complex forms. It does not require formwork or the construction of abutments. It is an archaic form of construction that was not widely used in Europe in post-Medieval times.

A review of the secondary literature of American bridge history, including state historic bridge inventories, also indicates that this triangular-shaped opening is rare. There are no similar examples documented in the HABS/HAER collection at the Library of Congress. Nor are there any examples that can be located through a search of Web resources, or mentioned in standard sources on American bridge technology and construction history. A limiting factor in the research is that most state departments of transportation do not comprehensively inventory culverts (defined by the Federal Highway Administration as any bridge with an opening of less than 20'). Maryland and Maine do inventory culverts, and neither of those states, both with traditions of early stone culverts and bridges, have known examples of triangular-shaped openings. Although the available data for comparison is not comprehensive or conclusive, Delaware's triangular culvert is without doubt a very rare form.

The lack of documentation makes any interpretation of the culvert speculative. The topography may have required that the culvert be built on a curve in the road. A triangular shape would definitely have been easier for a less skilled mason to build than a skewed arch, which is more complex and requires formwork and abutments. Thus, this simple culvert could be merely a local solution to a site-specific problem.

The stone culvert's significance is as an archaic and basic form of construction that is quite rare. It can be traced at least as far back as ancient Mycenaean culture in Greece, but the form is virtually unknown in North America. The culvert's primary significance is as an artifact – in fact the only source of information – that this form of simple construction remained in use here as late as the early 19th century.

**Sources:**

Lichtenstein Consulting Engineers, "Cultural Resources Survey and Evaluation, Pyles Ford Road (Road 239) Culverts," prepared for the Delaware Dept. of Transportation, May 2007.  
Delaware Dept. of Transportation. New Castle County Bridge Cards, 1921.  
Delaware Dept. of Transportation, Delaware's Historic Bridges, 2001.

CULTURAL RESOURCE SURVEY  
LOCUS IDENTIFICATION FORM

DELAWARE BUREAU OF  
ARCHAEOLOGY AND HISTORIC  
PRESERVATION  
HALL OF RECORDS  
DOVER, DELAWARE 19901  
(302) 678-5314



FORM CRS-1

FOR OFFICE USE ONLY

CRS # N-4283  
Quad 100M North  
SPO map # 06 05-37  
Hundred CHRISTIANA  
DOCUMENT 20-06778/0417

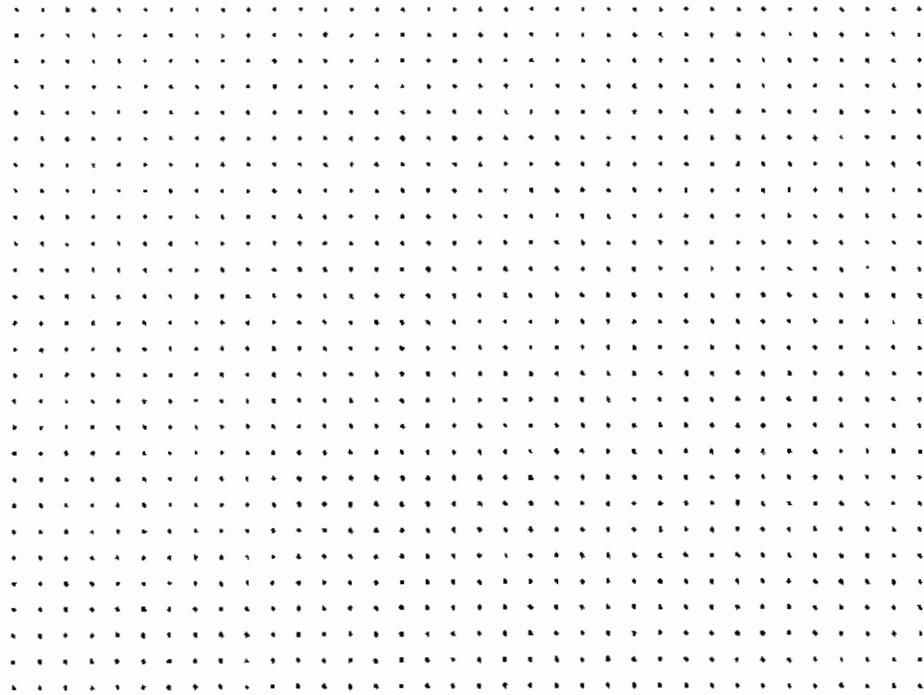
1. NAME OF LOCUS: RYLES LANE ROAD, WILSON BOUL. CORNER
2. STREET LOCATION: RYLES LANE ROAD, CROSSING WILSON BOUL. CORNER IN  
CITY OF DOVER
3. OWNER'S NAME: DELOITTE / DIV. OF RECORDS TEL. # \_\_\_\_\_  
ADDRESS: Box 278, Dover, DE 19901
4. TYPE OF LOCUS: a) structure \_\_\_\_\_ b) district \_\_\_\_\_ c) archaeological site \_\_\_\_\_  
d) other Structure
5. SURROUNDINGS OF LOCUS: (check more than one if necessary)  
a) fallow field \_\_\_\_\_ b) cultivated field \_\_\_\_\_ c) woodland   
d) scattered buildings \_\_\_\_\_ e) densely built up \_\_\_\_\_ f) other \_\_\_\_\_
6. THREATS TO LOCUS: (check more than one if necessary)  
a) none known  b) zoning \_\_\_\_\_ c) roads \_\_\_\_\_ d) developers \_\_\_\_\_  
e) deterioration \_\_\_\_\_ f) other \_\_\_\_\_
7. REPRESENTATION ON OTHER SURVEYS:  
TITLE: \_\_\_\_\_  
TITLE: \_\_\_\_\_  
TITLE: \_\_\_\_\_
8. YOUR NAME Geoff TEL. # \_\_\_\_\_  
YOUR ADDRESS 11111 11th Street  
ORGANIZATION (if any) City of DE OFF. S. 09-80

USE BLACK INK ONLY



8. SKETCH MAP SEE HIAER CARDS

Sketch features of site, if known in relation to its geographical surroundings such as drainage, etc. roads.



INDICATE NORTH ON SKETCH

9. COMMENTS

Consider the following

- a) relationship to setting
- b) associated traditions or stories
- c) noteworthy features
- d) comparison with others in area

SEE HIAER CARDS

USE BLACK INK ONLY



PHOTOGRAPHIC INVENTORY  
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION

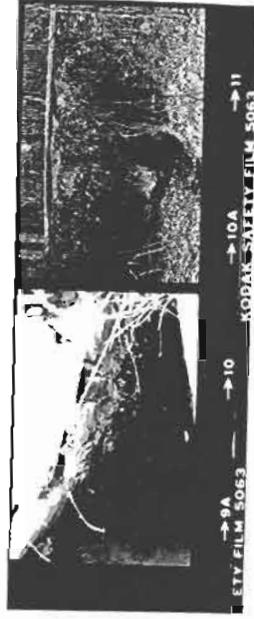
Document 20-06/79/01/11

CRS Number N-4283 Date Jan 1982 Contact Sheet # C-282

Description Byles Ford Rd / Wilson Run Culvert

Location (if other than Bureau collection)

Attach contact print







DELAWARE STATE HISTORIC PRESERVATION OFFICE  
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY  
PROPERTY IDENTIFICATION FORM

CRS # N-13673  
SPO Map 08-09-37  
Hundred Christiana  
Quad Wilmington North  
Other \_\_\_\_\_

1. HISTORIC NAME/FUNCTION: Culvert
2. ADDRESS/LOCATION: Pyles Ford Road x Wilson Run
3. TOWN/NEAREST TOWN: Centerville vicinity?
4. MAIN TYPE OF RESOURCE:
 

building	<input type="checkbox"/>	structure	<input checked="" type="checkbox"/>	site	<input type="checkbox"/>	object	<input type="checkbox"/>
landscape	<input type="checkbox"/>	district	<input type="checkbox"/>				
5. MAIN FUNCTION OF PROPERTY: Culvert
6. PROJECT TITLE/ REASON FOR SURVEY (if applicable):  
Pyles Ford Road improvements (DeIDOT)

7. ADDITIONAL FORMS USED:

#: Form:	List property types:
CRS 2 Main Building Form	
CRS 3 Secondary Building Form	
CRS 4 Archaeological Site Form	
CRS 5 Structure (Building-Like) Form	
CRS 6 Structure (Land Feature) Form	
CRS 7 Object Form	
CRS 8 Landscape Elements Form	
<input checked="" type="checkbox"/> CRS 9 Map Form	N/A
CRS 14 Potential District Form	
<input checked="" type="checkbox"/> Bridge/Culvert Form	

8. SURVEYOR INFORMATION:

Surveyor name: Patrick Harshbarger  
 Principal Investigator name: "  
 Principal Investigator signature: *PH*  
 Organization: Lichtenstein Consulting Engineers Date: 5-1-07

9. OTHER NOTES OR OBSERVATIONS:

CRS# N-13673

See Bridge/Culvert form

10. STATE HISTORIC CONTEXT FRAMEWORK (check all appropriate boxes; refer to state management plan(s)):

- a) Time period(s)
- Pre-European Contact
  - Paleo-Indian
  - Archaic
  - Woodland I
  - Woodland II
  - 1600-1750∇ Contact Period (Native American)
  - 1630-1730∇ Exploration and Frontier Settlement
  - 1730-1770∇ Intensified and Durable Occupation
  - 1770-1830∇ Early Industrialization
  - 1830-1880∇ Industrialization and Early Urbanization
  - 1880-1940∇ Urbanization and Early Suburbanization
  - 1940-1960∇ Suburbanization and Early Ex-urbanization

- b) Geographical zone
- Piedmont
  - Upper Peninsula
  - Lower Peninsula/Cypress Swamp
  - Coastal
  - Urban (City of Wilmington)

- c) Historic period theme(s)
- |  |  |
|--|--|
| <input type="checkbox"/> Agriculture           | <input checked="" type="checkbox"/> Transportation and Communication   |
| <input type="checkbox"/> Forestry              | <input type="checkbox"/> Settlement Patterns and Demographic Changes   |
| <input type="checkbox"/> Trapping/Hunting      | <input type="checkbox"/> Architecture, Engineering and Decorative Arts |
| <input type="checkbox"/> Mining/Quarrying      | <input type="checkbox"/> Government                                    |
| <input type="checkbox"/> Fishing/Oystering     | <input type="checkbox"/> Religion                                      |
| <input type="checkbox"/> Manufacturing         | <input type="checkbox"/> Education                                     |
| <input type="checkbox"/> Retailing/Wholesaling | <input type="checkbox"/> Community Organizations                       |
| <input type="checkbox"/> Finance               | <input type="checkbox"/> Occupational Organizations                    |
| <input type="checkbox"/> Professional Services | <input type="checkbox"/> Major Families, Individuals and Events        |



CULTURAL RESOURCE SURVEY  
MAP FORM

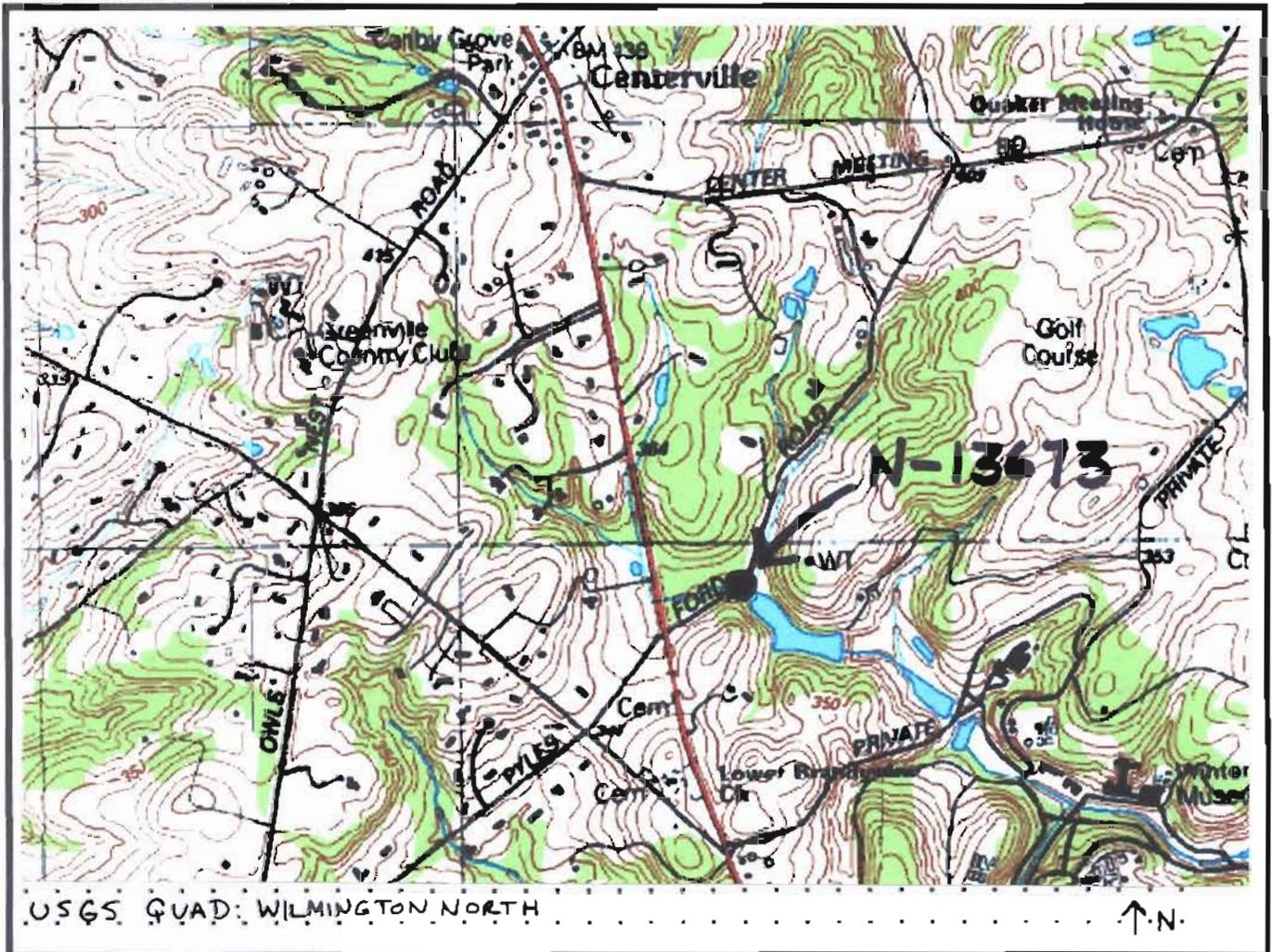
CRS # N-13673

1. ADDRESS/LOCATION: Pyles Ford Road x Wilson Run
2. NOT FOR PUBLICATION  reason: \_\_\_\_\_
3. LOCATION MAP:

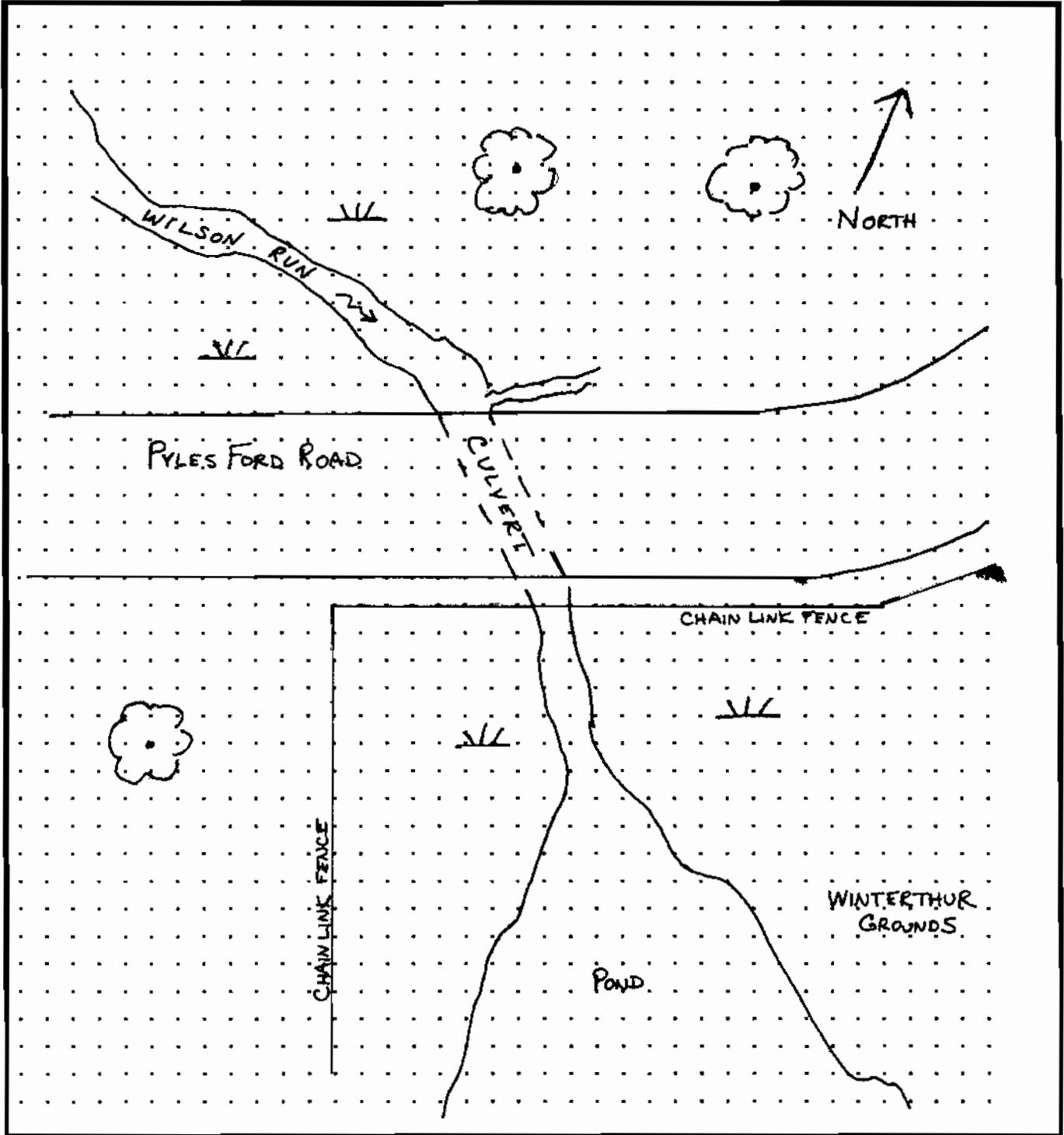
Indicate position of resource in relation to geographical landmarks such as streams and crossroads.

(attach section of USGS quad map with location marked or draw location map )

INDICATE NORTH ON SKETCH



INDICATE NORTH ON PLAN





DELAWARE STATE HISTORIC PRESERVATION OFFICE  
21 THE GREEN, SUITE A, DOVER, DE 19901

CULTURAL RESOURCE SURVEY  
STRUCTURE – BRIDGE/CULVERT  
DRAFT FORM

CRS # N-13673  
SPO Map 08-09-37  
Hundred Christiana  
Quad Wilmington North  
Other \_\_\_\_\_

BRIDGE NUMBER: None                      OWNER: State                      CRS#: N-13673  
COUNTY: New Castle                      HUNDRED: Christiana                      ZONE: Piedmont  
LOCATION: Approx. 300' E of DE 52                      SPO MAP: 08-09-37  
ROAD NUMBER: Road 239                      MILEPOST:                      USGS QUAD: Wilmington North

FACILITY CARRIED: Pyles Ford Road  
NAME/FEATURE INTERSECTED: Wilson Run

TYPE: Slab                      DESIGN:  
MATERIAL: Concrete  
# OF SPANS: 1                      LENGTH: 5 ft.                      WIDTH: 18 ft.  
DATE OF CONSTRUCTION: ca. 1910                      ALTERATION: Unknown                      SOURCE: Style/NCC Bridge Card  
DESIGNER/BUILDER: New Castle County

---

SETTING: The culvert carries a 2-lane road over a stream in a wooded setting. Pyles Ford Road is the northern boundary of Winterthur Museum & Garden. A modern chain link fence encloses the Winterthur property with a gate (Gate 6) approximately 100' southeast of the culvert. The stream feeds a pond located downstream of the culvert on the Winterthur property. The Winterthur property visible from the culvert is not open to the public and is mostly wooded. North of the culvert is a wooded lot and beyond to the north is a modern (almost new) residential development.

CURRENT NR STATUS: Not Previously Evaluated

NR RECOMMENDATION: Not Eligible

SUMMARY: The ca. 1910 short-span concrete slab culvert does not have integrity of original design due to loss of the railings and collapse of the wingwalls. It is a highly altered example of a very common 20th-century bridge type. It is not historically significant for its technology or setting/context.

PHOTO: Roll 1: 20-25                      REVIEWED BY: P. Harshbarger                      DATE: May 2007

doc# \_\_\_\_\_

USE BLACK INK ONLY

CRS-

**NAME/LOCATION/DATE OF CONSTRUCTION:** Culvert, Pyles Ford Road over Wilson Run, ca. 1910

**Physical Description:** The skewed, 5'-long (clear span) and approximately 18'-wide, concrete slab culvert is supported on roughly coursed fieldstone abutments. The culvert has lost its original railings, which consisted of two-high steel pipes over the opening and concrete parapets over the wingwalls as shown by the New Castle County bridge card photo dated May 17, 1921. A section of the pipe railing and parapet is still visible where it fell downstream of the culvert. A modern steel beam guide rail has been added to the south elevation, but there is currently no railing on the north elevation. The 8"-deep concrete slab is spalled at its fascia with no visible reinforcing bars; it is presumed that the slab, given its short length, is probably un-reinforced. The stone abutments and wingwalls have been undermined at all four corners and have partially collapsed.

**Summary of Alterations/Modifications:** Original railings lost. Loss of original fabric from spalling and scour, including collapse of stone wingwalls.

**Historical and Technological Significance:** DeIDOT has no plans for the culvert and no documentation for its date of construction. It is dated ca. 1910 based on style and that it was in place by 1921 as documented by a New Castle County bridge card. The card lists it as county culvert No. C-86, but does not provide a date of construction.

The concrete slab type developed along with the expanded use of concrete as a building material during the late 19th century. It proved ideally suited to short-span highway culverts and bridges (from a few feet up to 30' long) due to its ease of design and construction, strength, and low maintenance. It was also easily standardized allowing engineers to efficiently prepare plans and specifications that could be quickly adapted to many site conditions. Slab bridges and culverts were coming into ever increasing use in Delaware and nationally by 1910. State and county engineers throughout Delaware and the nation made widespread use of the slab type; literally thousands of examples were built with a variety of common railing treatments from parapets to pipe rails. Slab culverts continued to be built throughout the 20th century. The ca. 1910 slab culvert is not historically distinguished in comparison with the statewide population of similar resources.

**Sources:**

Lichtenstein Consulting Engineers, "Cultural Resources Survey and Evaluation, Pyles Ford Road (Road 239) Culverts," prepared for the Delaware Dept. of Transportation, May 2007.  
Delaware Dept. of Transportation. New Castle County Bridge Cards, 1921.  
Delaware Dept. of Transportation, Delaware's Historic Bridges, 2001.

DELAWARE STATE HISTORIC PRESERVATION OFFICE

PHOTOGRAPHIC INVENTORY - CONTACT SHEET

Negative location (if other than SHPO) \_\_\_\_\_

Photo Roll # 1 Surveyor P. HARSHBARGER Date 4-21-07

Frame #	CRS #	Description of view
8	N-4283	Upstream elevation - debris covers opening
9	"	Looking NE at stone parapet
10	"	Roadway view, looking NE
11	"	Detail of stone parapet, SW corner
12	"	Roadway view, looking SW
13	"	Oblique view of downstream elevation, looking SW
14	"	Downstream elevation, looking NW
15	"	Downstream elevation, looking N
16	"	Downstream elevation
17	"	Triangular opening detail
18	"	Detail of SW wingwall
19	"	Oblique view of downstream elevation, looking NE
20	N-13673	Roadway view looking E
21	"	Upstream elevation looking SE
22	"	Upstream elevation looking SE
23	"	Roadway view looking W
24	"	Downstream elevation looking NE
25	"	Downstream elevation looking NW



8 9 10 11 12 13



14 15 16 17 18 19



20 21 22 23 24 25