

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form*. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional certification comments, entries, and narrative items on continuation sheets (NPS Form 10-900a).

1. Name of Property

Historic name Chandler Mill Bridge

Other names/site number Chandlers Mill Bridge; Chester County Bridge #236

2. Location

street & number Chandler Mill Road N/A not for publication

city of town Kennett Township N/A vicinity

State Pennsylvania code PA county Chester code 029 zip code 19348

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this nomination request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property meets does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

national statewide local

Andrea McDonald
Signature of certifying official

11/19/2009
Date

PA Historical & Museum Commission

Title

State or Federal agency and bureau

In my opinion, the property meets does not meet the National Register criteria.

Signature of commenting official

Date

Title

State or Federal agency and bureau

5. Classification

Ownership of Property
(Check as many boxes as apply)

- private
- public - Local
- public - State
- public - Federal
- private

Category of Property
(Check only one box)

- building(s)
- district
- site
- structure
- building(s)
- object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
		buildings
		sites
1		structures
		Objects
		buildings
1		Total

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing)

N/A

Number of contributing resources previously listed in the National Register

N/A

6. Function or Use

Historic Functions

(Enter categories from instructions)

Transportation/road-related (vehicular)

Current Functions

(Enter categories from instructions)

Transportation/road-related (vehicular)

7. Description

Architectural Classification

(Enter categories from instructions)

Other: built-up plate through girder bridge

Materials

(Enter categories from instructions)

foundation: Stone

walls: Stone

Steel

roof:

other: Metal

Asphalt

Narrative Description

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with a **summary paragraph** that briefly describes the general characteristics of the property, such as its location, setting, size, and significant features.)

Summary Paragraph

The Chandler Mill Bridge was designed by Chester County Engineer Nathan R. Rambo and constructed by George Dole, a private contractor, for the County of Chester, Pennsylvania in 1910 (Photo 11) as a 47-foot long, single span, built-up steel plate girder bridge of riveted construction made of multiple plates and angles including web stiffeners, with two 36-foot long approaches to the abutments (Photos 1, 2, and 13). It is located on Chandler Mill Road in the southwest corner of Kennett Township, Chester County, Pennsylvania just northeast of the intersection of Chandler Mill Road with Bucktoe Road (Photo 7) and approximately one mile southwest of the Borough of Kennett Square. The bridge enables two-lane Chandler Mill Road to cross the West Branch of Red Clay Creek from northeast to southwest (Photo 3). It is bounded by the Chandler Mill site to its northeast (Photos 2 and 3) and by open meadows and woodland of mixed new and old growth to its northwest, southwest, and southeast (Photos 3, 4, 8, and 9). The bridge is situated on less than an acre of land at a low point along the banks of the West Branch of Red Clay Creek (Photos 1, 2, 5, 6, 12, and 13). It is overlooked on the northeast by two houses and accompanying outbuildings associated with Chandler Mill that are located on the northeast side of Chandler Mill Road (Photos 4, 6, 7, and 12) and on the southwest by a c. 1973 house located on the wooded hillside across Bucktoe Road opposite the bridge and above the intersection of Chandler Mill and Bucktoe Roads (Photo 10). There is one contributing resource that is a typical steel through girder bridge that features stone abutments and parapets and stone wingwalls which enclose the bridge's north and south approaches (Photos 1, 2, 6, 7, 10, 12, and 13). The bridge is in fair condition. There are no non-contributing resources.

Historic Appearance

The Chandler Mill Bridge was situated on a northeast/southwest axis over the West Branch of Red Clay Creek a few feet northeast of the junction of Chandler Mill Road with Bucktoe Road. The bridge was constructed as a 47-foot long, 18-foot wide, single-span, built-up steel plate through girder bridge of riveted construction made of multiple plates and angles including web stiffeners, with 36-foot long approaches at both ends. Its girders were supported on two hand-laid fieldstone abutments that featured hand-laid fieldstone parapets. The abutments were located on the banks of the creek, one per bank. The bridge's girders were composed of multiple steel plates for the web and steel angles for the top and bottom flanges that created an I-beam section with one girder on each side of the bridge (this type of girder is known as a built-up plate girder). The bridge's steel floor beams were placed in line with the bottom flanges of the pair of plate girders. The floor beams supported a concrete deck placed on top of them, enabling the roadway to pass between, or through, the paired plate girders; hence the name of this type of bridge – the through girder. The steel plate girders were supported by the fieldstone abutments, the floor beams were supported by the girders, and the road deck was supported by the floor beams. The tops of each of Chandler Mill Bridge's plate girders were finished with metal pipe hand railings supported by eight metal uprights each; the hand railings terminated into the approach walls. The 36-foot long approaches at either end of the bridge were enclosed in pairs of hand-laid fieldstone wingwalls integral with the abutments and capped with slate. A stone plaque listing the bridge number (County Bridge No. 236), the year of construction (1910), the names of the County Commissioners at the time (Swithin Shortlidge, Sebescus Cromleigh, and Francis C. Andrews), and the names of the clerk, contractor and County Engineer (E. Vinton Philips, George Dole, and N. R. Rambo, respectively) was placed in the center of the north wingwall of the northeast approach (Photos 10 and 11). The bridge was constructed eight and a half feet above the normal water level of the creek.

Current Appearance

Today, Chandler Mill Bridge looks much as it did when it was first constructed. It is a 47-foot long, 18-foot wide, single-span, built-up steel plate through girder bridge of riveted construction made of multiple plates and angles including web stiffeners that sits eight and a half feet above the normal level of the creek and is supported on fieldstone abutments. It still features its original, 36-foot long, hand-laid fieldstone wingwalls capped with slate and original fieldstone parapets; the original plate girders still feature their original metal pipe hand railings (Photos 1, 2, 6, 7, 10, 12, and 13). The only change, a non-structural one, that has occurred is that the deck was black-topped at some point after 1997 as part of a road improvement project for Chandler Mill Road (Photos 7 and 10). It is in fair condition: its metal work needs painting, the stone work needs re-pointing, and some of the slate caps on the wingwalls need repairing or replacing. However, structurally, its load-bearing members have not been changed or replaced.

Integrity

Because few changes have been made to the Chandler Mill Bridge and its setting, it has retained its integrity. Only one change has been made to the bridge since its construction in 1910 and that change is the addition of black-top to the deck which is a cosmetic change only, not a structural one. Its location had not changed nor has the bridge been moved from its location. The design of the bridge has not been altered even though the deck surface has been changed. Its rural setting has changed little since 1910. The Chandler Mill building is no longer extant; however, remnants of the mill race are still visible and the site of the mill is still discernable. And in c. 1973, a one-story, ranch-style house was constructed on the wooded hillside overlooking the bridge and the intersection of Chandler Mill and Bucktoe Roads; however, this house is not intrusive and does not detract from the setting (Photo 10). The bridge retains its key exterior materials including its original steel girders, fieldstone parapets, abutments, and wingwalls, and metal pipe hand railings. The only change to its materials is the addition of blacktop to its deck surface. Its workmanship is also virtually intact; albeit in a deteriorated condition. This condition does not detract from the bridge's ability to evince the workmanship of both its practical design and solid, efficient construction. The bridge has retained its feeling of and association with a period of time in bridge construction technology when municipalities were looking for inexpensive ways to provide save, strong bridges that could withstand the demands of ever increasing residential, commercial, and industrial traffic.

In conclusion, Chandler Mill Bridge possesses high integrity. It has retained its original location and the few changes made in its setting have not changed the essential rural character of the setting; therefore, it also has retained its setting. It has retained its original design, materials and workmanship which represent a bridge type that was popular, especially with frugal-minded, safety conscious municipalities, for road bridges for approximately forty years in the late Nineteenth to the mid-Twentieth Centuries in Chester County. Therefore, it has retained its feeling of and association with bridge construction from technology of that time period.

8. Statement of Significance

Applicable National Register Criteria

(Mark "X" in one or more boxes for the criteria qualifying the property for National Register listing)

- A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- B Property is associated with the lives of persons significant in our past.
- C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- D Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations

(Mark "X" in all the boxes that apply)

Property is:

- A owned by a religious institution or used for religious purposes.
- B removed from its original location.
- C a birthplace or grave.
- D a cemetery.
- E a reconstructed building, object, or structure.
- F a commemorative property.
- G less than 50 years old or achieving significance within the past 50 years.

Areas of Significance

(Enter categories from instructions)

Transportation

Engineering

Period of Significance

1910

Significant Dates

1910

Significant Person

(Complete only if Criterion B is marked above)

N/A

Cultural Affiliation

N/A

Architect/Builder

Rambo, Nathan R., P. E.

Dole, George, Contractor

Period of Significance (justification)

The Period of Significance of 1910 was chosen because that is the year that the Chandler Mill Bridge was erected.

Criteria Considerations (explanation, if necessary)

N/A

Statement of Significance Summary Paragraph (provide a summary paragraph that includes level of significance and applicable criteria)

Chandler Mill Bridge in Kennett Township, Chester County, Pennsylvania meets National Register eligibility Criteria A and C for its local significance as evaluated within the historic context of transportation in Kennett Township and bridge engineering in Chester County. The bridge's Period of Significance, 1910, was chosen because that is the year in which the bridge was constructed and no major changes have been made to the bridge since that time. The Chandler Mill Bridge was built by the County of Chester to replace an earlier township-owned and constructed bridge that had proven to be inadequate for the amount and type of traffic that used it. It relates to the themes of transportation and engineering for two reasons. First, it represents the evolution of the involvement of the county in local municipal transportation needs. It contributes to our knowledge of that evolution and the development of transportation systems throughout Chester County, representing the changing relationship between the county and its local municipalities as their transportation needs continued to increase with population increases and economic prosperity. Second, it is an important example of a little studied road bridge sub-type (through girder type of built-up plate girder bridge) that was constructed throughout Chester County from the 1890s through the 1930s as a cost-effective way to provide safe, strong bridges on a county-wide level. Chandler Mill Bridge represents this type of bridge which was built entirely for practical purposes, with no aesthetic considerations at all. It contributes to our knowledge of the evolution and development of bridge construction technology, representing a bridge type that was eventually, by the mid to late Twentieth Century, abandoned as better and more cost effective bridge engineering technologies were introduced.

Narrative Statement of Significance (provide at least one paragraph for each area of significance)*Brief History of Kennett Township*

Kennett Township was established by c. 1705, a time period of great development in Chester County during which most of the original townships in the County were established. Originally, the township included all of the present township as well as present-day Pennsbury Township and Kennett Square Borough and a portion of present-day Pocopson Township. Kennett Township was blessed with fertile, well-watered soils that encouraged the establishment of both farms and mills. In fact, both the West and East Branches of the Red Clay Creek flow through Kennett with the East Branch located more or less in the center of the township and the West Branch located near the western township line. The two branches come together in the lower south central part of the township, just north of the Delaware state line. The Red Clay Creek and its tributaries provided such a sufficiency of water power that milling was established as a viable industry in the township as early as 1689. The mills that were established in the township between 1689 and the mid to late 1800s included sawmills, grist mills, fulling mills, and paper mills. The township was also blessed with an abundance of natural resources including red and kaolin clays, limestone, and hornblende. These resources led to the development of quarries and mines between c. 1750 and c. 1910.

From the beginning, Kennett Township's economic base was diversified between agriculture and industry, with most of the industry being agriculturally based. These agricultural based industries included grist mills, fulling mills, and lime kilns. The rest of the industries concentrated on building materials (sawmills, red clay mines, and hornblende quarries) and materials for household products (kaolin clay mines). Later (c. 1856), the manufacture of paper was also introduced. In the mid-1950s, modern suburban tract house developments began to be introduced into the township and by the mid-1960s, Kennett Township had become a bedroom community for Kennett Square, Pennsylvania and Wilmington, Delaware. Today, Kennett Township, Chester County encompasses 9,929 acres of which approximately 2,080 acres are residential, 1,077 acres are non-residential, 3,470 are agricultural, 2,835 are wooded, and 467 are vacant or covered with water (Chester County Planning Commission, 2000).

Transportation Context – Roads and Bridges in Kennett Township

Kennett Township's road system developed in much the same way that road systems developed across Chester County. Once the county was established in 1682, roads became a major concern both of the settlers of the county and of William Penn and his representatives as developers of the Commonwealth. By 1700, a county-wide road system was developing that was comprised of county owned and maintained roads, proprietary roads (kings highways), and municipal owned and maintained roads. These roads were laid out in order to connect the farms with places of worship, markets, and mills (Winthrop, ps. 3-4). In the case of Kennett Township, roads were established fairly early in its history in order to connect the farms, quarries, and mines with both the mills, kilns and factories that turned the raw materials into finished products and the markets for those products. In 1742, the Nottingham Road (also known as the Baltimore Great Road) from Philadelphia was extended from Ashton (now in Delaware County) through Kennett and New Garden Townships (Kennett Square, p. 8 and Winthrop, p. 6). This was one of the earliest roads to be laid out through the county and was, as far as can be told, the first road to be officially laid out through the township; albeit there were earlier roads that had been established through common use. It later became the Baltimore Pike, and today, US Route 1 follows parts of its road bed. Other roads soon followed, with the first turnpike in the township, the Kennett Turnpike, being established

in the mid-1800s. The Kennett Pike connected the Borough of Kennett Square with Wilmington and ran through Kennett Township ("History of Kennett Township", www.kennett.pa.us/History/History).

In 1821, a road was deemed to be necessary between New Garden Township, Pennsylvania and the Kennett Square to Wilmington Road in order for milling and lime kiln products to be transported to favorable markets in Delaware. Therefore, Bucktoe Road was laid out from New Garden Township to the Kennett Square to Wilmington Road (Chester County Original Road Papers, vol. 36, ps. 137-155).

By 1860, a road on the east side of the West Branch of Red Clay Creek leading from Sinclair's Mill to Bucktoe Road was deemed necessary in order to connect the mills on the east side of the branch to the roads leading to markets in Delaware. Therefore, in 1861, a road was laid out starting in a public road near Sinclair's Mill, running along the east side of the West Branch of Red Clay Creek, and ending at Bucktoe Road near Chandler Mill (Chester County Original Road Papers, vol. 89, ps. 257-274). The road became known as Chandler Mill Road, named after the mill located near its junction with Bucktoe Road. Originally, when this road was laid out, it crossed the West Branch of Red Clay Creek to connect with Bucktoe Road via a ford known as Gregg's Ford. However, this ford proved to be dangerous whenever the creek was running high, so, sometime between 1861 and 1888, the Township of Kennett erected a bridge over the creek (American Republican, June 4, 1888).

Most of the roads in the township had to cross a body of water at some point. These crossings were originally accomplished via fords. However, the Red Clay Creek proved to be especially dangerous to ford, particularly during or just after periods of heavy rain, which could occur at any time of the year. Therefore, bridges were erected along the major roads where they crossed the Red Clay Creek or any of its main tributaries. The first bridges to be erected were usually very simple wooden bridges. By the early to mid 1800s, wooden covered bridges and stone arch bridges were being erected throughout the township. Eventually, eleven bridges were erected in the township. In the early to mid-1900s, as was happening throughout the county, the continued industrial development of the township increased the traffic demands on the bridges, necessitating the replacement of some of the earlier bridges with metal truss or plate girder bridges. Starting in the mid-1900s, the rapid changes in modes of transportation, from horse-drawn vehicles to gasoline-powered vehicles, necessitated even stronger bridges to carry the extra weight of the conveyances themselves. Therefore, continuing the trend throughout the county, seven of the fifteen bridges in the township were replaced with either pressed or steel reinforced concrete bridges. After 1955, four more bridges were added to the township's inventory.

By 1888, requests were being made to have the township bridge on Chandler Mill Road replaced. The existing bridge proved to be inadequate because it had been erected too low and too narrow – both the bridge and the north approach to the bridge tended to flood out whenever there was a freshet. The requests were for a wider bridge with an elevated approach (American Republican, June 4, 1888). The main stumbling block was the funding for a larger bridge. Like so many municipalities in Chester County during this time period, Kennett Township was faced with increasing demands for bigger bridges while its revenues were generally not increasing concurrently. The solution, sought by other townships through out the county, was to ask the county to take over the construction and maintenance of its bridges. It took several years to convince the county that it was in its own best interests to do so. Requests continued to be made for a new bridge at Gregg's Ford throughout the late 1800s and into the early 1900s. Finally, after several visits over a period of several years from various juries of view, the Chester County Courts agreed that it was not financially feasible for the township to construct a new bridge, that a new bridge, however, was needed, and so, therefore, the county would construct a new, county-owned bridge at the site of the township-owned bridge. The 1910 Jury of View recommended that the road need not be changed or varied and that no property damage would occur if the existing bridge was replaced in situ with a larger bridge (Chester County Original Bridge Papers, vol. 15, p. 24). The new county-owned bridge was erected in the late summer of 1910 and inspected in May of 1911 (*Ibid.*); presumably, it was opened to traffic sometime during that period of time. The bridge eventually became known as Chandler Mill Bridge, named after both the road on which it was located and the adjacent mill.

Engineering Context – Through Girder Bridges in Chester County

Built-up plate girder bridges, most often referred to as plate girder bridges, are "composed of rivet-connected plates for the web and angles for the flanges to make an I-beam section" ("History and Significance of Bridge Building Technology in Pennsylvania from the Earliest Days until 1956", p. 16). There are several types of plate girder bridges, the two most popular being the through girder and the deck girder. The through girder bridge is one in which "the floor beams of the

¹To the author's best knowledge, no studies or surveys have been written or conducted specifically on plate girder bridges; therefore, unless otherwise specifically noted, the information in this section about the history of their construction and use has had to be gleaned from various sources (listed more fully in the attached bibliography) including, but not limited to, the Lichtenstein Survey of 1996-1998, and individual resource forms from the HAER archives and from the National Register archives, as well as an interview with George Weaver, P. E., conducted on July 6, 2009.

bridge are placed in line with the bottom flange [sic] of a pair of girders with the roadway passing between the paired girders" (Ibid.). A deck girder bridge is one in which "the floor beams are placed near the top flanges of the girders and the roadway [is] located at the top of the girders" (Ibid.).

Plate girder bridges were originally constructed by the railroads starting in the mid-Nineteenth Century as an inexpensive way to carry their rail lines over creeks and roads. This type of bridge was built with no aesthetic considerations, instead, it was built strictly for practicality; it was an attempt to find a stronger substitute for wooden bridges while being less expensive to build than masonry bridges. Plate girder bridges were developed at the same time as other metal bridges including metal truss and metal arch bridges; but because of their simple, plain, unadorned design, they tended to be less expensive than even the simplest metal truss or arch bridge to construct. By about 1890, the convenience and cost-effectiveness of building plate girders and their reputation for stability and longevity had been recognized by road builders who began to construct them to carry roads over streams and railroad tracks. Because of their continued popularity, plate girder bridges continued to be constructed for both railroads and roads through the 1930s.

Through girder bridges, the most popular type of plate girder bridge, began to be constructed in Chester County, Pennsylvania in the 1850s for use by railroads. Originally, these bridges were constructed of iron. As steel manufacturing technology advanced, through girder bridges began to be constructed of steel rather than iron. Starting in the 1890s, steel through girder bridges began to be constructed for road use. Once this type of bridge began to be used for roads, its popularity took off. By the early 1900s, steel through girder bridges were the favored bridge type for roads and they were constructed throughout the county through the 1930s. As road bridge technology continued to advance, steel girders were replaced with concrete girders, so that by the mid-Twentieth Century, through girder bridges were being constructed of concrete. By the 1940s, road bridge construction technology had changed to more modern systems using reinforced and pressed concrete.

It is not known how many through girder bridges were actually constructed in Chester County throughout the time period of c. 1850 through c. 1930. As far as can be told, no surveys or inventories were conducted of the bridges of Chester County until the late Twentieth Century when two state-wide surveys were completed, one in the 1980s and one in the mid-1990s. For purposes of comparison, therefore, the latest survey, known as the Lichtenstein Surveyⁱⁱ, was used as the source material for information about the extant through girder bridges in the county. Hundreds of through girder bridges were built in their heyday; however, one thing the survey makes clear is that many of these hundreds of bridges had disappeared by 1998, when the survey was completed. According to the survey, by 1998, only 31 bridges of typical through girder design were left in Chester Countyⁱⁱⁱ. Thirty of these bridges were dated from 1899 to 1932 with one modern through girder bridge constructed in 1971. For purposes of comparison, the time frame for the construction of the extant through girder bridges in Chester County will be taken as being from 1899 to 1932; 1971 has been left out of the time frame because it is outside the scope of the National Register standards. This time frame has been divided into three periods, the early period, 1899 to 1910; the middle period, 1911 to 1921; and the late period, 1922 to 1932. Ten of these bridges were built in the early period of through girder road bridge construction, eight were built in the middle period of through girder road bridge construction, and twelve were built in the late period of through girder road bridge construction. The bridges from the early period are scattered all over the county with one bridge in each of the following townships: Elk, New London, East Fallowfield, Sadsbury, Honeybrook, South Coventry, Tredyffrin, Thornbury, West Goshen, and Kennett. Of these bridges, two (the Glen Rose Road Bridge in East Fallowfield Township and the Valley Forge Bridge in Tredyffrin Township) were replaced with modern bridges after the survey was completed and two have been altered, the Media Road Bridge in Elk Township had a new deck inserted into the structure of the bridge in 1950 and the Cambridge Road Bridge in Honeybrook Township had welded rolled floor beams inserted between the original riveted rolled floor beams and the concrete deck was replaced with an open steel grid deck in 1971. While the remaining six bridges have good to excellent integrity, two have had minor changes made to them, including the replacement of bolts with welds (the Lewisville-New London Road Bridge in New London Township) and the addition of curbs to the inside girders (the Thornton Road Bridge in Thornbury Township), and two of them are components of bridges comprised of multiple spans (the Newport Road Bridge in Sadsbury Township and the Eachus Mill Road Bridge in West Goshen Township). Only two of these bridges are single-span bridges comprised of one through girder bridge that also exhibit high integrity. These bridges are the Mount Pleasant Road Bridge in South Coventry Township which is a 50-foot long bridge supported on stone abutments and wingwalls with stone parapets. This bridge was constructed in 1904 by the County of Chester. And the second bridge is the Chandler Mill Bridge in Kennett Township which is a 47-foot long bridge

ⁱⁱA. G. Lichtenstein and Associates was hired by the Pennsylvania Department of Transportation (PennDot) to conduct the state-wide survey. This survey was conducted county by county in 1996-1998 and included bridges owned by the Commonwealth of Pennsylvania, county governments, municipal governments, and other owners such as the Pennsylvania Railroad.

ⁱⁱⁱThe Lichtenstein survey identified 35 extant through girder bridges; however, four of the bridges have been left out of this comparison either because they are not typical through girders (which is the case for three of them) or because they were replaced before the survey was completed (in the case of one of the bridges).

with steel floor beams and a concrete deck supported on stone abutments and wingwalls with stone parapets. This bridge was constructed in 1910 by the County of Chester. It was laid out and designed by Chester County Engineer Nathan R. Rambo and constructed by George Dole, private contractor. While both of these bridges have high integrity, they are not exactly duplicative in appearance. They were designed to meet very specific site needs which they have met admirably for approximately 100 years.

Besides, the early period Chandler Mill Bridge, Kennett Township also has a late period through girder bridge, the Hillendale Road Bridge. This bridge was constructed in 1932 by the County of Chester and is a 65-foot long bridge with rolled I-shaped floor beams and a concrete deck supported by concrete abutments with wingwalls capped by concrete parapets. Kennett Township, thus, has two through girder bridges which represent the evolution of through girder bridge construction technology from steel as the predominate material to the transition from steel to concrete as the predominate material. The Chandler Mill Bridge is an excellent example of an early period steel through girder bridge with stone abutments, parapets, and wingwalls that was constructed soon after steel replaced iron as the dominate construction material for through girder bridges but when stone was still being used as the material for the support systems for through girder bridges. The Hillendale Road Bridge is an excellent example of a late period steel through girder bridge with concrete abutments and parapets that was built at the time when road bridge construction was transitioning from stone as the material for the support systems to concrete as that material.

Developmental history/additional historic context information (if appropriate)

Over time, the West Branch of Red Clay Creek proved to be an ideal source of water power for mills. Chandler Mill, first a fulling mill then a grist mill, was erected on the east bank of the West Branch of Red Clay Creek in 1821 and was operated first by the Gregg family and then by the Chandlers. By 1910, when the current Chandler Mill Bridge was erected, Chandler Mill had changed hands and was owned by the Becker family who ran a sawmill located further downstream at Kaolin and Marshall Bridge Roads. Chandler Mill had ceased operations by 1920 and disappeared altogether by the 1990s; although its site, the bed of its mill race, and the ruins of its dam are still visible today.

Chandler Mill Bridge was laid-out and designed by Nathan R. Rambo. Nathan Rambo was born in 1869 in the village of Eagle in Uwchlan Township. He attended the Windsor School in that township before moving to West Chester with his family in 1875. He completed his education in the public schools of West Chester in the mid-1880s (Daily Local News, March 26, 1952). After he finished his public schooling, he began his training as a surveyor with Walter A. MacDonald, County Surveyor. The office of County Surveyor was created by the County of Chester in 1850. The law that established the office called for the election of a trained practical surveyor every three years. The office of County Surveyor replaced the position of deputies to the Surveyor General (American Republican, April 30, 1850). The terms "Surveyor" and "Engineer" appear to have been used interchangeably throughout this time period.

By 1889, Nathan Rambo had surveyed and mapped the Borough of Malvern which was incorporated in August of that year (Daily Local News, March 26, 1952). By 1903, he had been appointed as the Surveyor for the Borough of West Chester. In that year, he completed four maps for West Chester showing the location, size, and length of all the sewer lines in the borough as well as the location of each inlet tap and connection for all the sewer lines (Daily Local News, October 24, 1903). These maps are still in use today because of their accuracy. In the same year, Rambo surveyed and located the Waynesborough trolley line (Daily Local News, April 19, 1904).

County Surveyor Walter A. MacDonald died in office in 1904, so Nathan Rambo, who had become his right hand man and chief assistant, was appointed to fill out the rest of MacDonald's term. Rambo was then elected as County Surveyor at the next general election (West Chester Star, May 30, 1914). As County Surveyor he planned and built 85 bridges throughout the county (Daily Local News, March 26, 1952), most of these bridges list him on their plaques as "County Engineer". Rambo favored stone arch and steel through girder bridges at a time when metal truss bridges were being championed by other local engineers.

In addition to his other responsibilities, Rambo also trained twenty young men to become surveyors (Daily Local News, March 26, 1952). Rambo continued as County Surveyor, successfully running for re-election five times, until 1919. In that year, the Office of County Engineer was established by the County Commissioners. The first County Engineer started serving in 1920 (Coatesville Record, January 5, 1940). Rambo then went into the real estate business which he continued until his death. Nathan R. Rambo died in 1952 in West Chester (Ibid.).

Summation of Significance

As the only early period through girder bridge in Kennett Township and as one of only two early period, single-span, through girder bridges still intact in Chester County, the Chandler Mill Bridge is eligible at the local level under Criterion A

for its association with the transportation history of Kennett Township and the County of Chester. It reflects the growing need of the township for strong bridges able to withstand increasing loads. It also reflects a point in time, 1910, when Chester County was beginning to take over, albeit reluctantly, the construction and maintenance of municipal bridges because the municipalities could no longer afford to do the job themselves. Because of the increasing demand on the county's budget, it sought a cost-effective solution to providing the various municipalities with strong, efficient bridges. The solution was the construction of aesthetically plain but structurally strong plate girder bridges, with through girder bridges being the most popular of that type to be constructed. Chandler Mill Bridge, a plain through girder bridge which has been able to carry increasing weight loads for close to 100 years, is representative of the use of aesthetically plain, strong bridges throughout both the Township of Kennett and the County of Chester.

The Chandler Mill Bridge is eligible at the local level under Criterion C because it is a good representative example of single-span through girder bridges and it is an early example of the use of steel in through girder bridges. Plate girder bridges, including through girders, have not been well documented or studied because they have been thought to be very common, undistinguished types of bridges. However, no matter how common or popular they were in their heyday, they appear to be disappearing from the landscape, with only 35 left in Chester County by 1998; at least three of those have since been replaced and at least two have had major changes made to them. No matter how common they were or undistinguished they are, they represent, collectively and individually, a stage in the evolution of transportation needs and bridge construction technology both on the county level and the township level. Therefore, good, intact examples of through girder bridges are worthy of inclusion on the National Register because they represent that little studied stage in the evolution of bridge construction technology occupied by plate girder bridges. Chandler Mill Bridge is a good representative example of a single-span, steel through girder bridge because it has had no changes made to it since its construction in 1910; only one other bridge in the county can also make that claim.

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets)

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Previous documentation on file (NPS):

- preliminary determination of individual listing (36 CFR 67 has been requested
- previously listed in the National Register
- previously determined eligible by the National Register
- designated a National Historic Landmark
- recorded by Historic American Buildings Survey # _____
- recorded by Historic American Engineering Record # _____

Primary location of additional data:

- State Historic Preservation Office
 - Other State agency
 - Federal agency
 - Local government
 - University
 - Other
- Name of repository: _____

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property Less than one acre
(Do not include previously listed resource acreage)

UTM References

(Place additional UTM references on a continuation sheet)

1	<u>18</u>	<u>438933.85</u>	<u>4407063.61</u>	3	<u> </u>	<u> </u>	<u> </u>
	Zone	Easting	Northing		Zone	Easting	Northing
2	<u> </u>	<u> </u>	<u> </u>	4	<u> </u>	<u> </u>	<u> </u>
	Zone	Easting	Northing		Zone	Easting	Northing

Verbal Boundary Description (describe the boundaries of the property)

The boundary of the Chandler Mill Bridge is a rectangular parcel having as its southwestern boundary a line, centered on the center line of Chandler Mill Road, 48 feet in length along the eastern line of Bucktoe Road and as its northeastern boundary a 48-foot long line parallel to the southwestern boundary at a distance of 80 feet from the intersection of the center line of Chandler Mill Road with the eastern line of Bucktoe Road. These two parallel boundary lines are connected by two parallel northwestern and southeastern boundary lines that connect the east corner of the northeastern boundary to the east corner of the southwestern boundary and the west corner of the northeastern boundary to the west corner of the southwestern boundary, thus forming the rectangular parcel.

Boundary Justification (explain why the boundaries were selected)

The boundaries that were selected for Chandler Mill Bridge encompass the 47-foot long, 18-foot wide, single-span Chandler Mill Bridge and its 36-foot long northeast and 36-foot long southwest approaches. These approaches are defined by the two pairs of the bridge's wingwalls which are 36 feet long per pair.

11. Form Prepared Byname/title Jane E. Dorchester, Architectural Historian and Historic Preservation Consultantorganization S. A. V. E.date July 9, 2009street & number 19 S. Church St. 2Btelephone 610-431-3737city or town West Chesterstate Pazip code 19382e-mail jeditorhspv@verizon.net**Additional Documentation**

Submit the following items with the completed form:

- **Maps:** A USGS map (7.5 or 15 minute series) indicating the property's location.

A **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Continuation Sheets**
- **Additional items:** (Check with the SHPO or FPO for any additional items)

Photographs:

Submit clear and descriptive black and white photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

ALL PHOTOGRAPHS ARE AT LEAST 1600X1200 PIXELS AT 300 PPI. THEY HAVE BEEN PRINTED ON EPSON PREMIUM LUSTER PHOTO PAPER USING EPSON ULTRACHROME K3 INKS.

Name of Property: Chandler Mill Bridge
City or Vicinity: Kennett Township
County: Chester **State:** Pa.
Photographer: Tom Mills
Date Photographed: March 27, 2006
Description of Photograph(s) and number: Close-up, Chandler Mill Bridge and its northeast approach, looking southwest.
Photo 1 of 13.

Name of Property: Chandler Mill Bridge
City or Vicinity: Kennett Township
County: Chester **State:** Pa.
Photographer: Tom Mills
Date Photographed: January 17, 2006
Description of Photograph(s) and number: Chandler Mill Bridge and its northeast approach, with the Chandler Mill site in left foreground, looking northwest.
Photo 2 of 13.

Name of Property: Chandler Mill Bridge
City or Vicinity: Kennett Township
County: Chester **State:** Pa.
Photographer: Jane E. Dorchester
Date Photographed: February 23, 2009
Description of Photograph(s) and number: Chandler Mill Bridge and its northeast approach, looking southwest.
Photo 3 of 13.

Photographs, Continued:

ALL PHOTOGRAPHS ARE AT LEAST 1600X1200 PIXELS AT 300 PPI. THEY HAVE BEEN PRINTED ON EPSON PREMIUM LUSTER PHOTO PAPER USING EPSON ULTRACHROME K3 INKS.

Name of Property: Chandler Mill Bridge

City or Vicinity: Kennett Township

County: Chester **State:** Pa.

Photographer: Jane E. Dorchester

Date Photographed: February 23, 2009

Description of Photograph(s) and number: Chandler Mill Bridge, right background, with Mill Tenant House, left background, and new woods growth, foreground, looking east.

Photo 4 of 13.

Name of Property: Chandler Mill Bridge

City or Vicinity: Kennett Township

County: Chester **State:** Pa.

Photographer: Jane E. Dorchester

Date Photographed: February 23, 2009

Description of Photograph(s) and number: Close-up, Chandler Mill Bridge, center background, with new woods growth, foreground, looking east.

Photo 5 of 13.

Name of Property: Chandler Mill Bridge

City or Vicinity: Kennett Township

County: Chester **State:** Pa.

Photographer: Jane E. Dorchester

Date Photographed: February 23, 2009

Description of Photograph(s) and number: Close-up, Chandler Mill Bridge over the West Branch of Red Clay Creek, looking north.

Photo 6 of 13.

Name of Property: Chandler Mill Bridge

City or Vicinity: Kennett Township

County: Chester **State:** Pa.

Photographer: Jane E. Dorchester

Date Photographed: February 23, 2009

Description of Photograph(s) and number: Close-up, intersection of Bucktoe Road, foreground, with Chandler Mill Road, showing Chandler Mill Road over Chandler Mill Bridge, looking northeast. Please note Mill Tenant House, left background.

Photo 7 of 13.

Name of Property: Chandler Mill Bridge

City or Vicinity: Kennett Township

County: Chester **State:** Pa.

Photographer: Jane E. Dorchester

Date Photographed: February 23, 2009

Description of Photograph(s) and number: Chandler Mill Bridge setting, showing West Branch of Red Clay Creek, right middle ground, with meadows and new growth woods, looking south. Please note that Chandler Mill Bridge is hidden in clump of trees, center middle ground.

Photo 8 of 13.

Photographs, Continued:

ALL PHOTOGRAPHS ARE AT LEAST 1600X1200 PIXELS AT 300 PPI. THEY HAVE BEEN PRINTED ON EPSON PREMIUM LUSTER PHOTO PAPER USING EPSON ULTRACHROME K3 INKS.

Name of Property: Chandler Mill Bridge
City or Vicinity: Kennett Township
County: Chester **State:** Pa.

Photographer: Jane E. Dorchester
Date Photographed: February 23, 2009

Description of Photograph(s) and number: Chandler Mill Bridge setting, showing meadows and woods on either side of West Branch of Red Clay Creek with wooded hill on the west side of Bucktoe Road, background, looking south.

Please note that Chandler Mill Bridge is visible, off-center, middle ground.

Photo 9 of 13.

Name of Property: Chandler Mill Bridge
City or Vicinity: Kennett Township
County: Chester **State:** Pa.

Photographer: Jane E. Dorchester
Date Photographed: February 23, 2009

Description of Photograph(s) and number: Close-up, Chandler Mill Road over Chandler Mill Bridge, with c. 1973 house on hillside, background, looking southwest. Please note the plaque located in the center of the north (right) wingwall, right middle ground.

Photo 10 of 13.

Name of Property: Chandler Mill Bridge
City or Vicinity: Kennett Township
County: Chester **State:** Pa.

Photographer: Jane E. Dorchester
Date Photographed: February 23, 2009

Description of Photograph(s) and number: Close-up, Chandler Mill Bridge plaque, located in the center of the north wingwall, looking north.

Photo 11 of 13.

Name of Property: Chandler Mill Bridge
City or Vicinity: Kennett Township
County: Chester **State:** Pa.

Photographer: Jane E. Dorchester
Date Photographed: February 23, 2009

Description of Photograph(s) and number: Close-up, Chandler Mill Bridge and its southwest approach with Mill Tenant House, right background, looking north.

Photo 12 of 13.

Name of Property: Chandler Mill Bridge
City or Vicinity: Kennett Township
County: Chester **State:** Pa.

Photographer: Jane E. Dorchester
Date Photographed: February 23, 2009

Description of Photograph(s) and number: Chandler Mill Bridge over the West Branch of Red Clay Creek, middle ground, looking north.

Photo 13 of 13.

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C.460 et seq.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, PO Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Project (1024-0018), Washington, DC 20503.