10. NAME(S) OF STRUCTURE

State Bridge Number 577

11. PHOTOS (W/ FILM ROLL & FRAME NO.) AND SKETCH MAP OF LOCATION

75A:13-25 3E:6-8

3E:8

12. SOURCES

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Spero, Paula A. C. Metal Truss Bridges in Virginia: Suffolk Construction District. (Charlottesville, Virginia: Virginia Highway & Transportation Research Council, 1981).
Every Evening, November 16, 1931.

Delaware State Archives. New Castle County Levy Court Records, Specifications, Proposals, Contract and Bond files.
Delaware State Archives. New Castle County Road Commissioners Records, 1750-1940.
Hagley Museum. New Castle County Engineer Quarterly Reports.
Delaware DOT records: contract files.
Plans on file at Delaware DOT: Contract #BNC-4,1080, 2142, 84-074-02, 68-060-01, 74-040-01

13. INVENTORIED BY:	**AFFILIATION**	**DATE**
P.A.C. Spero & Company with Kidde Consultants for Delaware DOT		April-November 1988

HABS/HAER INVENTORY

See "HABS/HAER Inventory Guidelines" before filling out this card.

1. NAME(S) OF STRUCTURE

State Bridge Number 577

2. LOCATION

North Church Street over Brandywine River
Wilmington, New Castle County, Delaware

3. DATE(S) OF CONSTRUCTION

1932

4. USE (ORIGINAL/CURRENT)

Vehicular

5. RATING

BASC

6. CONDITION

Good: Some cracking and calcium stains in abutment posts. The bascule leaf no longer operable.

7. DESCRIPTION

State Bridge Number 577 (Church Street or Eleventh Street Bridge) is a six span bridge, comprising a single leaf, deck girder trunnion bascule span and five reinforced concrete girder spans. The bridge features extensive Art Deco-influenced architectural detailing: the abutments, wing walls, piers, parapet, and operator's building feature a variety of battered, stepped, and striated motifs expressive of the "skyscraper style". The superstructure is supported by concrete piers with coursed ashlar bases, and concrete abutments with U-shaped wing walls. The abutments are marked by massive stepped end posts whose form is echoed in the bascule pier; the wing walls rise above grade to form an approach wall with stepped buttresses and end blocks. The piers are battered and feature vertical striations; the girders are curved to create the appearance of segmental arches between the piers. The parapet comprises a series of block forms spanned by a concrete balustrade with stepped openings. The bascule leaf is no longer operable. The bridge measures 332'-7" in length, and carries four lanes of traffic on a 44'-0" wide deck with an 8'-0" sidewalk on either side. Operating machinery is concealed below the roadway within the bascule pier.

8. HISTORICAL DATA

Delaware Department of Transportation records state that Bridge 577 was built in 1932. This is confirmed by a bridge plate which also states it was built under jurisdiction of the Levy Court of New Castle County and also lists the members. The bridge replaced a steel drawbridge dating from 1869 located slightly downstream. In 1932, Alban P. Shaw was the county engineer. The structure was designed by Ash, Howard, Needles & Tammen of Kansas City and New York City. The construction contract was awarded to Seeds and Derham of Philadelphia on November 10, 1931. The Concrete Steel Company, also of Philadelphia, supplied the reinforcing steel; the structural steel and operating machinery for the bascule span were produced by the American Bridge Company of Ambridge, Pennsylvania. Additional contracts were awarded to D. E. O'Connell & Sons, Inc. and the A. Petrillo Company, Inc., both located in Wilmington, Delaware. O'Connell built the sidewalks, curbs, and roadway approaches for $9728.00, and Petrillo supplied the fill for the approaches. As promised by County Engineer, Shaw, the bridge project provided the opportunity to create much needed jobs for area residents suffering from the Depression. The contract specifications note additional details of the bascule bridge. The counterweight, made of concrete, is offset by cast iron balance blocks. An electric motor operates the bascule leaf, supplemented by an auxiliary hand mechanism. The operator's house stands at one end of the bridge, finished in light gray brick "to match the color of the finished concrete surfaces" of the bridge. The specifications provided that the piers be embedded in solid rock and required that the contractor assume the cost of any change in the depth of the piers beyond that stated in the plans; such a change proved necessary, generating a cost increase of $6952.32. The concrete piers were required to be faced with ashlar masonry. The specifications allowed for the reconstruction of a raceway at the north end of the bridge, for the removal and reconstruction of the screen house associated with it and the construction of a new spillway. Notes on original drawings indicate the structure was designed for 60 ton electric railway cars, while notes on the 1968 repair drawings indicate that the trolley tracks and original timber roadway were removed, and the span was made a fixed span with all machinery left intact in 1952. Delaware Department of Transportation records indicate that repairs have occurred in 1952, 1963, 1968, and 1984.

9. SIGNIFICANCE

State Bridge 577 is one of seven remaining historic bascule bridges carrying vehicular traffic in Delaware. Although it is no longer operable as a movable bridge, the machinery for the bascule is still in place. The bridge also derives significance from its association with the prominent engineering firm of Ash, Howard, Needles & Tammen; this firm or its associates designed five of the nine movable highway bridges surveyed in Delaware. J. A. L. Waddell, imminent bridge engineer and historian, as well as an innovator of the type, described bascule bridges in 1916 as follows: "they represent, probably, the best and most profound thought that has ever been devoted to bridge engineering". The bascule bridge was the earliest type of movable bridge built. In its most primitive form it was a shallow deck which could be raised to a vertical or inclined position by means of an outhaul cable attached to the free end. The bascule bridge design evolved over the centuries, and during the late nineteenth and early twentieth centuries it was developed in numerous patented types. In general, these patented bascule designs were either of a pivoting, or trunnion, variety or a rolling type. State Bridge 577 is of the trunnion type. There are several patented types of trunnion bascule bridges including the Strauss, Chicago , Waddell and Harrington, patented by J. L. Harrington, the same engineer involved with Bridge 688. The trunnion bascule differs from the rolling lift bascule in that the entire weight of the leaf and counterweight is carried by the trunnion and trunnion bearings, located approximately at the center of gravity of the mass. In some cases, the machinery and the counterweight are placed in a pit below the deck within the bascule pier; this made possible an exterior design free of visible machinery, an appropriate choice for urban settings. In addition to its significance as an extant bascule bridge, Bridge 577 is an exceptional example of an embellished long-span urban bridge.