10. NAME(S) OF STRUCTURE

State Bridge Number 161

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

5A:26-36A 6A:3-8

5A:27

12. SOURCES

Mack, Warren W. "A History of Motor Highways in Delaware", in Reed, Henry Clay, Delaware: A History of the First State, vol.2, pp.535-550 (NY: Lewis Historical Publishing Co., 1947).

Delaware State Program. Delaware State Highways; The Story of Roads in Delaware.... [Newark, Delaware: Press of Kells, 1919].

Federal Writers Project. Delaware: A Guide to the First State. (New York: Viking Press, 1938).

Carter, Dick. The History of Sussex County. Georgetown, Delaware: Community Newspaper Corp., 1976.

Hancock, Harold Bell. The History of Sussex County, Delaware. [s.l. : s.n.] 1976.

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

Delaware State Archives. Sussex County Road Papers. 1875-1940. ms. State Archives, Dover, Delaware.

Delaware DOT: Structures Division files

Plans on file at Delaware DOT: Contract #941, 82-099-12, 62-120-01

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 161

2. LOCATION

Road 28A, Poplar Street over Broad Creek
Laurel, Sussex County, Delaware

3. DATE(S) OF CONSTRUCTION

1915

4. USE (ORIGINAL/CURRENT)

Vehicular

5. RATING

SW

6. CONDITION

Good

7. DESCRIPTION

State Bridge 161 (Poplar Street Bridge in Laurel) is a hand-operated, center bearing, swing bridge consisting of Warren pony trusses. The swing bridge is 112 feet long, and consists of two 56 feet long spans. The substructure consists of a center pier of timber and concrete abutments. Measuring 14 feet wide from curb to curb, the bridge is considered a one lane bridge. The trusses have seventeen panel points. The top chord consists of 2 - 4" x 3" x 3/16" angles with a 10" x 3/16" top plate. The bottom chord is a 7" channel. The struts are two 3" x 2-1/2" x 3/16" angles and the verticals are two 2-1/2" x 2-1/2" x 3/16" angles. The floor system is formed by 12" I-beams at 6'-11" on center (corresponding to panel points) that run under the truss; 4"x12" creosoted floor joists run longitudinally and are topped by 4"x10" planking. Curbs are built up of 2"x8" and 6"x8" lumber. A 2" pipe forms two rows of railing. Although no longer operable, this swing bridge originally pivoted on a center bearing with eight balance wheels at the rim. The mechanism for hand-operation is visible on the deck.

8. HISTORICAL DATA

State Bridge 161 was built in 1915 as noted on 1946 plans for repairs to the Poplar Street Bridge, and on the original 1922 plans for an adjacent Laurel bridge (Bridge #152 over Central Avenue). The 1922 plans also reveal that two sets of repairs had been completed on the bridge by 1936, and that by 1943 it was in "bad shape". Repairs to improve the structural condition of Bridge #161 occurred in 1946, including the temporary removal of the truss so new timber bents could replace the original central concrete pier. The contract for that work was awarded on February 27, 1946. The bridge reopened to traffic in November of the same year. Drawings from the repairs are on file with Delaware Department of Transportation (Contract No. 941) and note that the bridge opened about 100 times per year and could carry a load of 15 tons.

9. SIGNIFICANCE

State Bridge Number 161 is significant as one of only two extant swing bridges surveyed on Delaware highways, and as the earliest swing bridge in the state. In addition, it is a contributing element in the Laurel Historic District. According to J. A. L. Waddell, imminent nineteenth and early twentieth century bridge engineer and historian, as well as an innovator of the type, swing bridges were the most common movable spans in use prior to 1916. The earliest swing bridges were constructed of wood and were put into motion by the approaching vehicle. As the rotating wooden bridge gave way to the metal swing span, its form varied. The main span could be made of plate girders; open-webbed, riveted girders; riveted trusses; or pin-connected trusses. A swing-span bridge rotates on its central pier and rests in a position perpendicular with the roadway, thus opening two channels for passing marine traffic. Disadvantages of the swing-bridge type, in general, included the time required for opening and closing the bridge, the obstruction of the waterway created by the pivot pier, and the uselessness of dock-front property adjacent to the opening span.In addition to classifying swing spans by structural type, they can be differentiated by the mode in which they rotate and are attached to the central pier. The span's weight is either supported at the center pivot (center bearing) or on small roller bearings or wheels that run on a steel track (rim bearing) a short distance from the center. Both these types were in common use, each with its own advantages. Since the pivot bearing wears with use and is expensive and difficult to replace, parts which should serve only to steady the span, not to carry loads, were frequently overloaded. Often a bridge designed to be center bearing would function in a rim-bearing capacity. For this reason, it was recommended that center-bearing swing spans be used only for short, lightweight spans. Long, heavy spans were designed as either rim-bearing swing bridges or as combination center bearing and rim bearing. Solely rim-bearing swing spans had strong disadvantages and were not hastily recommended. The rollers and track necessary in rim bearing spans required great care in construction and delicate adjustments in their erection. Repair work was expensive, and unequal settlement of the bridge disrupted the entire turning apparatus. Span length and site conditions thus controlled the choice of swing bridge form and mechanical design.