10. NAME(S) OF STRUCTURE
State Bridge Number 686

11. PHOTOS (W/ FILM ROLL & FRAME NO.) AND SKETCH MAP OF LOCATION
49B:18-27

49B:18

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).
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.
Delaware DOT records: Annual Reports; contract files.
Plans on file at Delaware DOT: Contract # 474, 202, 70-10-021

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 686/
Conrail 0.55, Del. River Ext.

2. LOCATION

U.S. 13 Business Over Conrail
Wilmington, New Castle County, Delaware

3. DATE(S) OF CONSTRUCTION

1938/78

4. USE (ORIGINAL/CURRENT)

Vehicular

5. RATING

SG

6. CONDITION

Good

7. DESCRIPTION

State Bridge Number 686, also known as Conrail Bridge Number 0.55 on the Delaware River Ext., is a composite structure thirty-one spans long. The 39'-0" main span comprises 12 concrete encased steel girders. The other spans are concrete slabs. The deck is 59'-0" wide and carries four lanes of traffic. The concrete parapet has a geometric design with incised rectangles and diamond shaped openings. Geometric blocks divide the parapet wall at the span divisions. The main span is accentuated by an enlarged parapet with a corbeled cap. The substructure consists of concrete abutments and U-shaped wing walls. The main span, the steel girder portion, is supported by concrete piers, while the slab spans are supported by individual concrete columns with mushroom capitals grouped in threes at each end. Bridge 686 is very similar to Bridge 684.

8. HISTORICAL DATA

State Bridge 686 was designed to eliminate a grade crossing at the Pennsylvania Railroad and Reading Company tracks. Grade crossings posed a dangerous junction between railroad and highway traffic, accounting for thousands of fatalities in the United States in the first quarter of the twentieth century; in 1926, the Delaware State Highway Department began a systematic program of eliminating these hazardous crossings. The railroad companies acted in cooperation with the Highway Department to replace grade intersections with separated crossings. In some cases, grade crossings could be eliminated by relocating the road or the railroad tracks, or both, but this program generally involved the construction of over- or underpasses. Around 1940, the federal government began to offer assistance for this type of construction through the Federal Aid highway program of the Public Roads Administration. In the federally-assisted grade separation projects of the period, the cost of construction was borne by the federal government, with the State and the railroad company sharing responsibility for right-of-way acquisition expenses. Delaware Department of Transportation records indicate that Bridge Number 686 was constructed in 1937-40, under Highway Department Contract Number 690 (Federal Aid Project WPGH 41). Bids were received on June 9, 1937, and the contract was awarded to J. A. Bader & Co. of Wilmington, Delaware, for the bid price of $205,685.00. Contract correspondence indicates that the Reading Railroad was initially reluctant to participate in a grade crossing elimination at this location, but finally agreed to relocate its tracks. Problems with securing the necessary access for the contractor further delayed the project.

9. SIGNIFICANCE

State Bridge 686 is a multiple span, embellished example of a concrete encased steel girder bridge. Its Art Moderne ornamentation is stylistically very similar to Bridge No. 684 and Sussex County Bridge No.257E, both grade crossings. Most steel and concrete bridges surveyed in Delaware were single spans with little ornamentation. In addition to these characteristics, the bridge's slab spans are late applications of an early twentieth century technological innovation more commonly used in building construction, the concrete slab on mushroom columns. The reinforced slab carried on round columns with flared capitals was first developed for building design by C.A.P. Turner in 1905. Application of the mushroom column and concrete slab to bridge construction occurred shortly after that. As the scientific understanding of reinforcement increased in the twentieth century, the form evolved to include a beam which connected cylindrical columns and to the commonly used pier form more typically seen in mid-twentieth century bridge design. Bridge 684 also was designed to eliminate a grade crossing at the Pennsylvania Railroad tracks. Grade crossings posed a dangerous junction between railroad and highway traffic, accounting for thousands of fatalities in the United States in the first quarter of the twentieth century; in 1926, the Delaware State Highway Department began a systematic program of eliminating these hazardous crossings. The railroad companies acted in cooperation with the Highway Department to replace grade intersections with separated crossings. About 1940, the federal government began to offer assistance for this type of construction through the Federal Aid highway program of the Public Roads Administration.