NORTH AND SOUTH TRAFFIC VOLUME AT DIFFERENT PERIODS OF THE DAY THAT WILL USE THE LINCOLN PARK THROUGH ROAD, CHICAGO, ILL.

Period	Curb arrangement	Length of period hours	Direction of travel per cent N.	Direction of travel per cent S.	Movement per cent of 24 hr. volumes N.	Movement per cent of 24 hr. volumes S.
Morning rush 6:30-9:30 a.m.	6 lanes So. 2 lanes No.	3 hr.	17.7	82.3	3.2	15.1
Daylight normal 9:30 a.m.-4:00 p.m	4 lanes So. 4 lanes No.	6.5 hr.	46.7	53.3	13.1	15.0
Evening rush 4:00-7:00 p.m.	2 lanes So. 6 lanes No.	3 hr.	76.3	23.7	17.2	5.3

to the sump tanks; the pumps withdraw the hydraulic fluid from the sump tanks and put it again in circulation. The pressure tank pressures vary from 1,800 to 2,400 lb. per sq. in. The system has enough capacity for raising or lowering all three lines of curbs without excessive pressure drop.

Initially to prepare the system for hydraulic action, it is necessary to introduce glycerine into each of the 16-in. spherical pressure tanks. Then "Hycon" fluid is introduced on top of the heavier glycerine in the pressure tanks and also into the 16-in.-diameter sump tanks. When the system is sealed, nitrogen is introduced through charging valves into the pressure tanks.

The pump stations, which measure about 4½ ft. x 2 ft. 2 in. in plan by 2 ft. 4 in. high are mounted on concrete pedestals and house two 1-hp. motors that operate high pressure pumps that are capable of delivering 130 cu. in. of oil per minute at 1,750 rpm. Also located in these stations are the switches, gages and other hydraulic and electrical accessories that are necessary for operation.

Throwing a switch at the control station allows 220-volt a.c. single-phase current to flow to the motors through pressure switches. The motors then operate the pumps which supply oil to the pressure tanks through a relief valve. Should the oil pressure exceed a predetermined amount, a relief valve will by-pass further pumpage to the sump tanks. However, this is not normally possible since the pressure switch, which is set about 100 lb. less than that for the relief valve, will cut out the motors. Once the line switch is thrown in, all operations become automatic and the result is a constant pressure in all of the pressure tanks.

When the traffic control switch is thrown, a solenoid is actuated which allows oil to flow at the established pressure through relief valves to the jacks which raise the units in the first section of the first division of curb and so on as previously described. When a line of curb is to be lowered, the traffic-control switch is thrown out, allowing the solenoid to fall, which reduces the oil pressure in the jacks to zero. The flexed springs then pull the curb down, forcing the oil back into the sump tanks, where it is fed back into the pump by suction as required.

Credits

The operation described is being carried out by the Chicago Park District Commissioners, R. J. Durham, president, Ralph H. Burke, chief engineer, and James P. Gallagher, principal construction engineer.

Wichert Spans on Potomac Bridge

***Contents in Brief**—For a new $1,000,000 bridge over the Potomac River at Hancock, Md., Wichert pinned rhomboid panels over the intermediate piers have been used for both truss and girder spans. Crossing includes a six-span continuous truss section, two five-span continuous plate girder sections, a four-span continuous plate girder and seven simple I-beam spans.*

AN INTERESTING ADAPTATION of the Wichert truss design has recently been incorporated in a new bridge built by the State Roads Commission of Maryland, in cooperation with the West Virginia State Roads Commission, to replace the old interstate bridge over the Potomac River at Hancock, Md. and to provide a grade separation with two nearby railway lines and an intersecting highway. Both the truss and the girder spans in the bridge utilize the Wichert pinned rhomboid panel over the intermediate piers, claimed advantages of which are that stresses do not increase due to pier settlement nor with temperature differences in top and bottom chords, and that, since it makes the structure statically determinate, the stresses can be computed with greater accuracy and rapidity than is possible with the conventional continuous truss. In the case of the Hancock Bridge a substantial saving of metal, a pleasing architectural effect and reduced substructure work are said to have resulted.

Since a new bridge near the old structure would have involved costly rights-of-way, undesirable alignment and a dangerous traffic intersection, the location shown by Fig. 2 was chosen, which provides both good grades and safe sight distances. Starting at the north end, the project consists of the following features:

(1) A four-span Wichert continu-

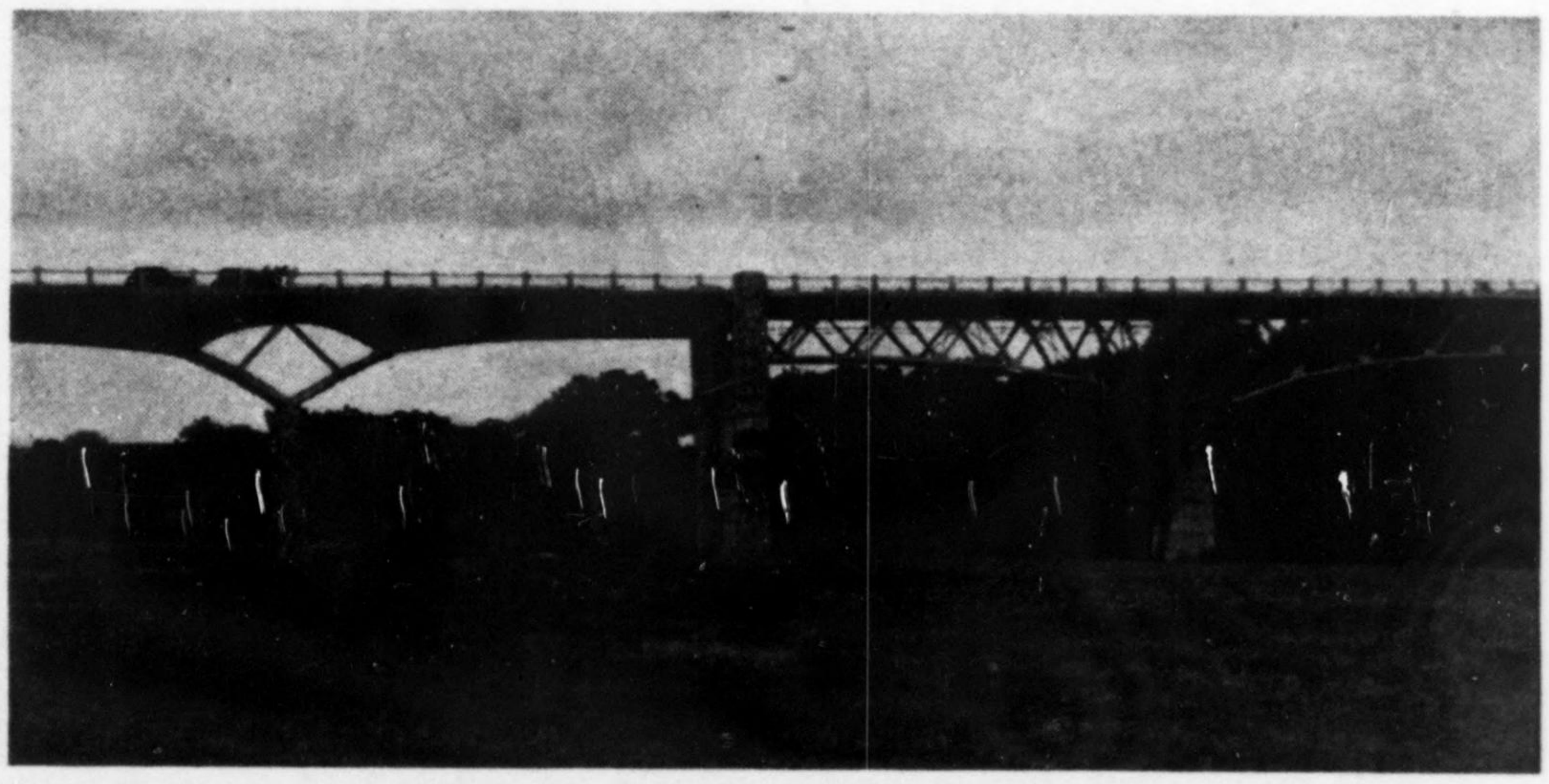

Fig. 1. Modernistic piers provide an effective transition between girders and trusses.

ous plate girder spanning Tonoloway Creek and Route 40, the end spans being 130 ft. and interior spans 160 ft.;

(2) An earthfill section 388 ft. long;

(3) A section spanning the Western Maryland Ry. and the C&O canal, consisting of seven simple I-beam spans totaling 308 ft. and a five-span Wichert continuous plate girder unit having 100-ft. end spans and 140-ft. interior spans;

(4) A six-span Wichert continuous truss section over the Potomac River —end spans here being 117 ft. 9 in. and interior spans 196 ft. 3 in.; and

(5) An approach on the West Virginia side consisting of a five-span Wichert continuous plate girder with 100-ft. end spans and 140-ft. interior spans passing over the Baltimore & Ohio R. R. tracks.

The plate girder spans over Route 40 and Tonoloway Creek have a center depth of 6 ft. 6 in., which increases to 20 ft. over the piers while the plate girder spans joining the South end of the I-beam section over the Western Maryland Ry. to the main river bridge have the same depth over the piers but are only 5 ft. 6 in. deep at the center. The main river truss spans, with curved bottom chords, have a depth at the center of 11 ft. and at the piers of 30 ft. 6 in. The West Virginia approach is similar to the plate-girder construction at the north end of the river crossing.

The truss spans are carried on solid reinforced concrete piers with semicircular ends, while for the girder span piers two circular shafts connected by a web wall are used. One of the modernistic piers, providing an effective transition between girder and truss spans, is shown in Fig. 1. Abutments are of the open bent type with massive pilaster posts.

In constructing the foundations all concrete was pumped from the mixer to hoppers located on top of the substructure units from which it was transferred to the forms through elephant trunk chutes equipped with baffle plates to prevent segregation. All concrete was placed with the aid of internal vibration and was water-cured. Due to the use of plywood forms, no rubbing was necessary.

Superstructure work was begun on the West Virginia approach with locomotive cranes on the Baltimore & Ohio Ry. erecting in one piece the girders to span the tracks. Temporary bents were required at each pier until the rhomboid members could be erected. A traveler crane was then placed on the completed span for erection of the remaining girder spans of this approach and the truss spans of the river crossing. These girders were also erected in one piece but the truss spans were placed in three pieces, an intermediate falsework bent being required for each span.

The I-beam and girder spans at the Maryland end of the main crossing were erected simultaneously with the truss spans and in much the same way as the girders of the West Virginia approach. However the end girders for the crossing over Tonoloway Creek were erected in two pieces and those for the center spans in three pieces, this work being done in much the same way as erection of the truss spans.

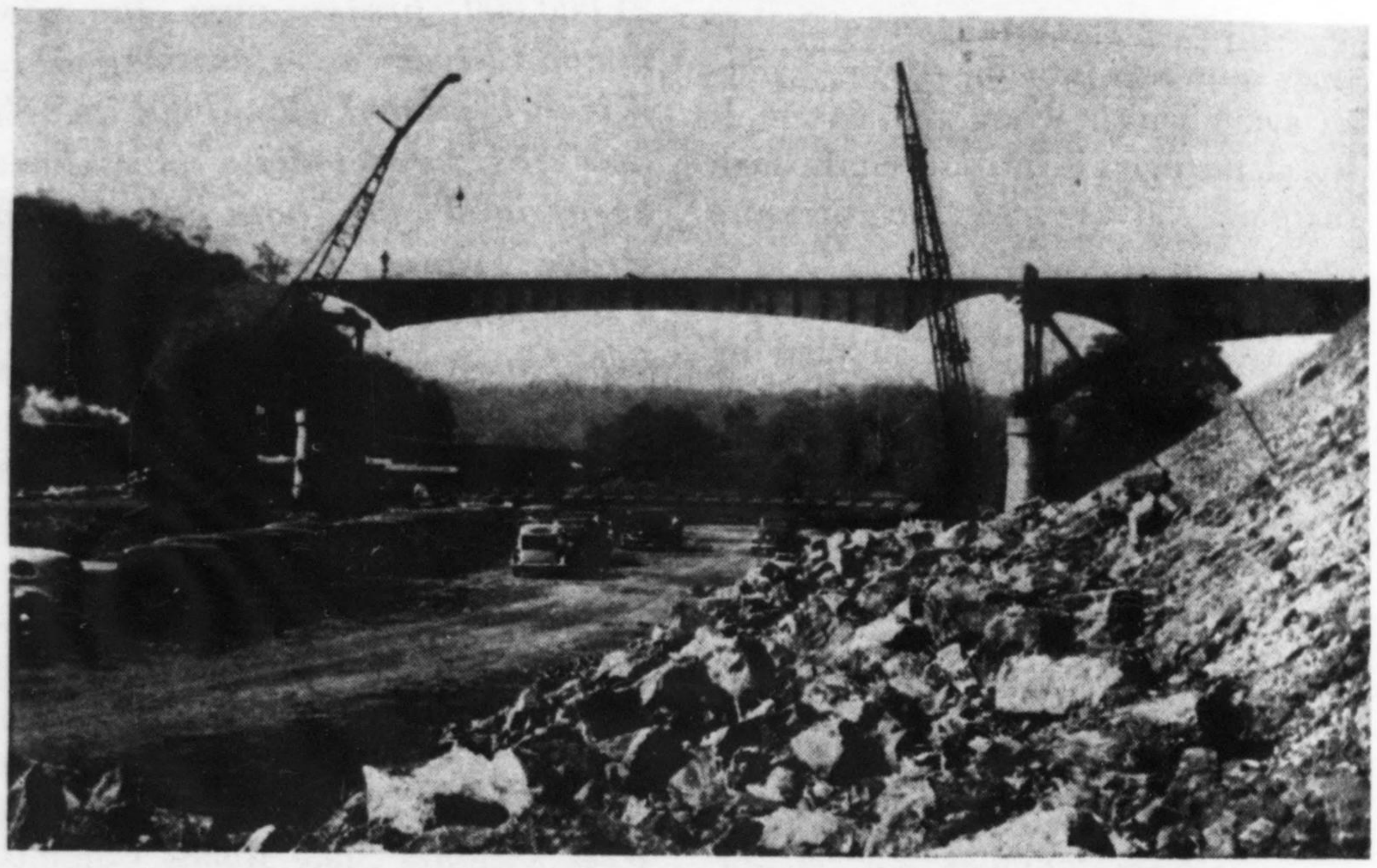

Fig. 3. **Erection of the rhomboid panels required temporary bents over the piers.**

Fig. 2. **Good alignment is provided, costly rights-of-way avoided, and dangerous traffic intersections eliminated with the location shown.**

The project was completed at a cost of about $1,000,000, one-half the cost having been met by federal grant and the remaining cost shared equally by West Virginia and Maryland. Bridge Engineer W. C. Hopkins, under the direction of Chief Engineer Nathan L. Smith, was in charge of design and supervision for the Maryland State Roads Commission. C. Steuart Linville was resident engineer, and L. T. Downey, district engineer. Geo. B. Hazelwood, Cumberland, Md., the general contractor, was represented on the job by W. C. George. All structural steel was fabricated and erected by the Bethlehem Steel Co., with C. W. Leatherman in charge.