the possible flexibility in the track layout since the structure is designed to carry any arrangement of tracks on 12-ft. centres. This was obtained with very little additional cost over a fixed position of tracks and driveways. It was in this structure that those responsible for the design decided that no expansion joints were necessary and their judgment seems to have been justified.

D., L. & W. R.R., Buffalo, N.Y., Terminal

The highly satisfactory results obtained with the flat-slab system at the Soo Line Terminal prompted its consideration and adoption by the Delaware, Lackawanna and Western Railroad in the recent construction of a viaduct approach to the station of the new terminal improvement at Buffalo, N.Y. (See Fig. 1.) The viaduct, 154 ft. in width and 1,070 ft. in length, supports a structural steel trainshed, platforms, and seven tracks on ballasted floor. This is shown in plan and cross-section (Fig. 2). For reasons analagous to those cited in the first example, deck construction was admirably adapted to the maximum development of full terminal facilities in a very limited area. This new layout is located alongside the Buffalo River. Docking facilities are for Great Lake steamers which can be unloaded directly under cover of the slab where storage and other shipping facilities, including the express companies, are available. Two tracks are located on the dock level which connect by means of the subway and ramp tracks, with the main line tracks on the upper level. Passenger traffic is discharged on the upper level precluding interference with other station appurtenances best located on the ground level.

The entire structure is supported on timber piles and gravity footings. A precautionary measure was taken to prevent possible movement of piles by connecting all the piers in both longitudinal and transverse direction with reinforced-concrete beam structs or ties, thus insuring lateral stability. Single drop panels connect corresponding columns of bents 1 and 2 to reinforce the end section

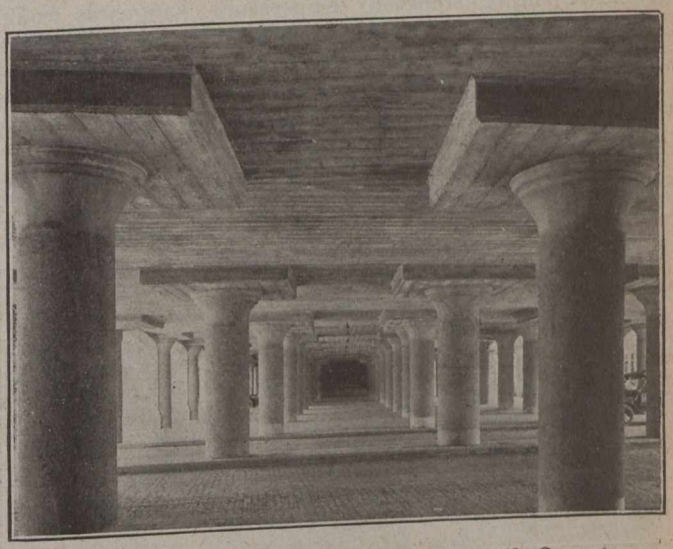

Fig. No. 5—Underside of Slab at South Orange

to take impact transferred from the bumping post which is anchored to the slab. The perfectly flat unobstructed floor simplified the waterproofing treatment which consists of a membrane composed of two layers of cotton cloth saturated and applied with hot asphalt and protected by a cover of asbestos paper and two ¾-in. layers of

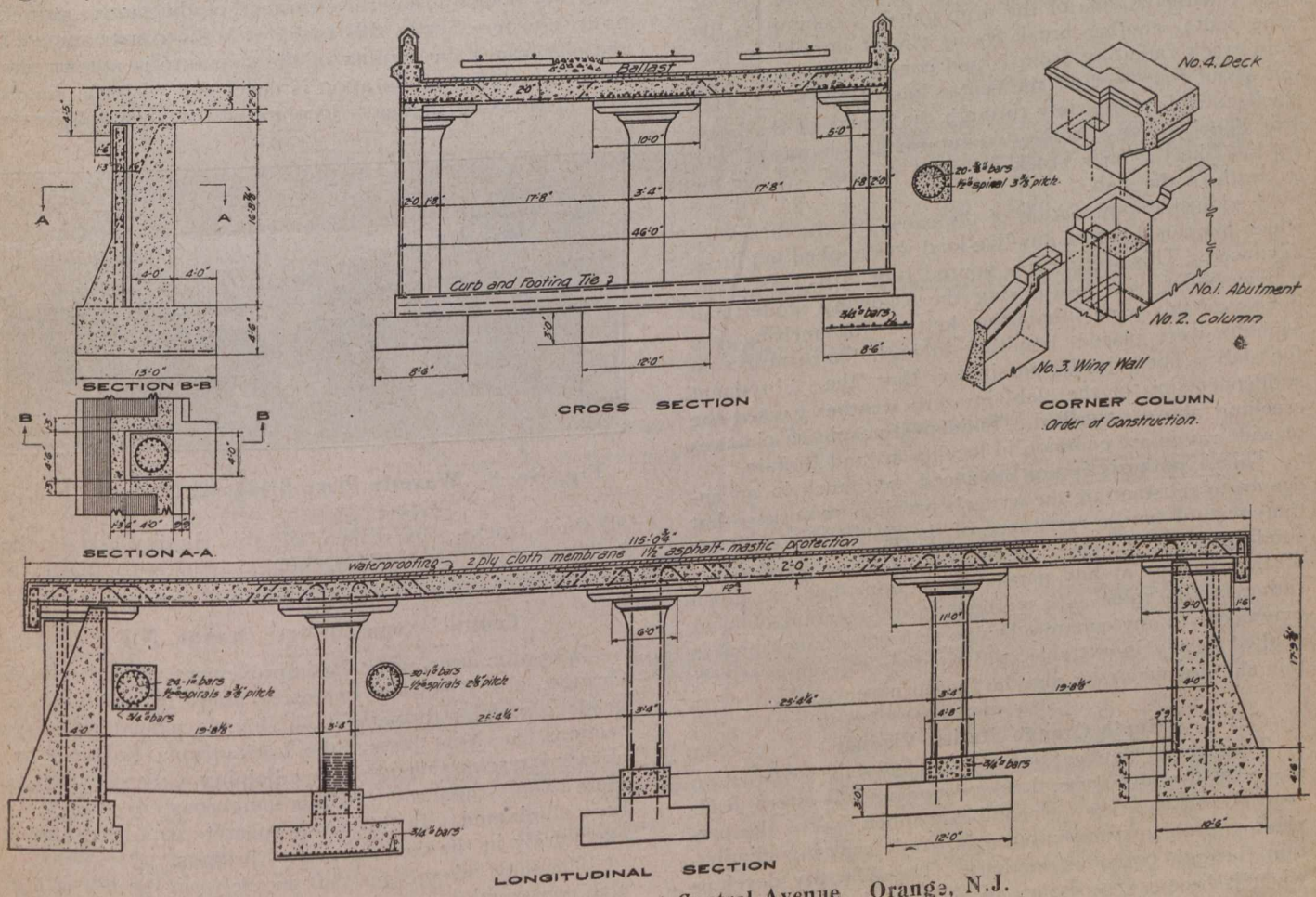

Fig. No. 6—Details of Bridge at Central Avenue, Orange, N.J.