water line. The description of the design and construction of this viaduct the writer has undertaken to present in this paper.

The line approaches the west end of the structure with a six degree curve through a rock cutting and crosses on a tangent bearing N. 10°—27′ W., the grade rising 0.40 ft. per hundred. The layout consists of twenty-four towers 58′ 9″ centers and twenty-five intermediate spans 100′ 3″ c. to c., the end spans being 100′ 10½″ center of bent to outer end of steel; all the tower spans are alike and also the intermediate spans, except that the masonry ends are extended to give the required bearing. The towers and bracing are made alike as much as possible, necessitating one set of templates only for the spans and parts of towers which duplicate each other. A Through girder system of construction was adopted, the girders being spaced 17′ 6″ c. to c., while the floor beams with gussets were spaced 14 ft. c. to c., along the plate girders. The east end span is on a spiral to a 6 degree curve and in consequence the girders are deflected at this abutment 1′ 3″ off the tangent to the structure produced. There were several reasons which led to the adoption of a Through girder system. In high trestle construction where the use of falsework is out of the question, the most economical layout is that of an intermediate span as long as could be handled with a well designed traveller working from grade, so as to reduce the number of high towers, their pedestals and foundations. Spans of 60 ft. with 40 ft. towers are generally employed where deck girders are used, spaced 9 ft. c. to c., and bridge ties resting on the top flanges. Owing to the Through girder system having a spacing of girders 17′ 6″ c. to c., spans of 100 ft. are handled, since the bearings of the traveller rest on the flanges, thus giving that much more base to brace the traveller in handling loads. The stability of the erection outfit is amply provided for so that in this case girders weighing 30 tons were placed in position. It certainly gives a feeling of safety to see from the car window the flanges of a heavy steel girder, and that this is not altogether sentiment is shown by the fact that instances of derailment are recorded, in which the car held to the roadway by the lateral resisting power of these girders.

Substructure.—The approach at the east end being through a rock cutting, in order to avoid building the steel work on a curve, and also to utilize the material in the cutting without waste, an abutment of reinforced concrete placed on top of the rock fill was decided on. A buried pier built from the original surface at this point would have been over 100 ft. high, difficult to design and build, and very costly. This was avoided by the use of a bank abutment. The concrete was reinforced to prevent danger of cracks from settlement in the bank, and in order to give time for the bank to settle, the ends of the girders were temporarily supported by a