

Weehawken Shaft will extend the Bergen Hill Tunnel, parallel, single track tunnels which are to be masonry lined throughout. At Weehawken Shaft they are extended on under the North River as tubes and come up at a shaft on 11th Avenue. At Hackensack portal the grade is high enough for an over-head crossing of the N.Y.C. & H.R.R. tracks which are only a few feet above the tide on the marshes. From here a 1.3% grade extends to a point under the center of the Hudson River where it changes to a 1.4% for the climb up to the terminal. At Weehawken Shaft grade is about 75 ft. below mean tide level and under the center of the river about 130.

The preliminary surveys for this work were most complete in every detail. Borings were taken, tide gages kept, and extensive tests with screw piles in the silt of the river bottom made. The triangulation was performed by methods equal to Government work. It was based on a quadrilateral which had two of its corners in Jersey and two on Manhattan. The measured base line was on the Jersey side and the angles at the corners were measured in every combination. In some cases over a hundred repetitions were made. The accuracy of this work is shown in the check when the River tubes met in September by a check of 0.08 ft. off in elevation and 0.03 ft. in alignment, and this error may have been made in the tedious process of carrying the alignment through the air locks.

1.00 ft. for distance