

tops of the piers will be capped with heavy cast iron plates for the tube-rollers to work upon.

The approaches of the common and railroads will consist of four segmental arches of stone at each end of the bridge, and of about sixty feet span, extending across both wharves, high enough to leave the wharves entirely unobstructed, and terminating in abutments with curved wing walls. Between the parapet of the arches and the wings of the abutments, and extending from both ends of the tube and side-roads, embankments will be made for the railroads and common roads, the railroad embankment will be wide enough to lay several railroad tracks upon, which will be closed in from view beyond the points, where the common roads will turn off on to the streets and levee of the city, as well as at East St. Louis. The grades of the common roads will descend from the ends of the bridge at the rate of about six feet in the hundred, and the railroad grades will descend at the rate of thirty feet to the mile, westwardly, to Main street, where the fill will be about two and one-half feet; and eastwardly, across Bloody Island, a distance of about three thousand feet, to the level of two feet above high water mark. The approaches from the city to the bridge will be from the levee and from Main street, as well as from the side streets, and will require one whole block of ground, and the eastern half of two other blocks. The approaches for the foot passengers, to and from the end of the tube in the city, will be by way of four spiral staircases, two at the sidewalk of the levee, and two at Main street. The stairways will lead to and from a double foot-way, on an iron trestle, along and over the railroad tracks, from Main street to the end and top of the tube. And there will be a similar foot-way extending from the east end of the tube to the top of the levee, on Bloody Island, with spiral staircases, in the curve of the wing walls of the abutment. These trestles will be twenty-five feet above the railroad tracks, and their supports will be small hollow cast iron columns. The tube, and other iron work connected therewith, will be painted white on the south side, and the tube will be covered with some non-conducting substance, in order to neutralize, as much as possible, the effects of the sun on the exposed surfaces.

The height of the bottom of the tube will be sixty-four feet above low water mark, or thirty feet above the curb-stone of the