modern examples of road and railway bridges.

top with wrought-iron bands 3 in. x ½ in. They are driven with a batter of 1 in 10, and are tied together at the top, and 1 ft. 6 in. above Trinity high water, with timber sills 12 in. x 12 in., mortised and spiked into the heads of the piles. Fifteen feet to the rear of these piles, others of the same scantling, and also spaced 6 ft. apart, but placed at an angle of 20° from the vertical, are driven to a depth of 3 ft. below high water. A continuous waling 12 in. x 6 in. at the back of these piles, and a short distance from the top, connects them together, as shown in Fig. 1, where it will be seen that a series of tie bolts 1½ in. diameter tie the front row of piles to the rear row. Behind the former is placed close planking of timber 4 in. thick, and creosoted, spiked to the piles, and extending as far as 12 ft. below Trinity high water. These planks are in lengths of 18 ft. and 24 ft., and are arranged to break joint with each other, the joints being well caulked.

Behind this sheathing the whole of the space is filled up level to the top of the timber sill which surmounts the piles, the material being well consolidated to prevent settlement.

The foundations of the abutments and wing walls of the bridge are of concrete in Portland cement, and arranged as shown in Plate VI.; generally, the foundations are taken 20 ft. below Trinity high water, and are 11 ft. 6 in. thick, 26 ft. 7 in. wide, and 43 ft. 1 in. long. On the east side the foundations are carried below those on the west, in each case the concrete being taken down to the gravel foundation.

The abutments and wing walls above the level of the concrete foundations are of brickwork, and are of the form shown in Plate VI.; the footings of the brickwork surmount the concrete 12 ft. below high water in the east abutment, and 9 ft. below on the west side, and they extend over the whole area beneath the abutments and wing walls; the walls of the abutments are 3 ft. thick below the plinth, and 1 ft. 10½ in. above that level; the space between these walls is filled in solid with Portland cement concrete, and the wing walls decrease in thickness from 4 ft. 1½ in. at the base, to 1 ft. 10½ in. at the top. Between the wing walls, and passing into the abutments, are arched subways 12 ft. 6 in. wide by 10 ft. high on the west side, and 11 ft. wide by 6 ft. 3 in. high on the east side, the thickness of the arch being 18 in. The arrangement and construction of these subways are shown in the drawings, where it will be seen that they are intended for the reception of a double row of gas mains, each 4 ft. inside diameter, provided with special castings for attachment to the gas boxes which pass over the bridge.

Between the wing walls at each end, and almost at their extremities, a valve well of brickwork is constructed, as shown in Figs. 2, 3, and 4. This well is 7 ft. wide and 14 ft. 6 in. long, and is bedded upon concrete, as shown in sections, Figs. 3 and 4, in the former of which the footings are 4 ft. 6 in. below Trinity high water, but in the latter they are at a considerably higher level, the difference being made good by a mass of concrete, as shown in Fig. 4. Within these wells are placed the valves, as seen in the sections, and by them the flow of the gas through the mains is regulated. The whole of the brickwork in the abutments and wing walls is built in Portland cement to a level of 1 ft. above Trinity high water, and is faced with dark red and blue bricks.

At the line of springing of the arches, and extending for the length of the wing walls, is a stone plinth 15 in. deep, and chamfered, as shown in the elevation. The caps of the abutment pilasters are also of stone, and the wing walls are coped, the stones being 16 in. by 9 in. by 3 ft. long. The ornamental necking course, shown in Fig. 1, is 9 in. deep, and is formed of terra-cotta tiles 2 in. thick. It may here be noticed that this material is extensively and artistically introduced into the designs of the different buildings on the works, and that the stone employed—a building material recently introduced into London—is from the Millstone Grit quarries of North Wales.

The abutments are connected by two wrought-iron arched ribs, having a clear span of 175 ft., and 13 ft. rise. The depth of the ribs at the centre is 6 ft., increased to 7 ft. at the haunches. This excessive depth was required in order that the gas mains carried between them might be entirely protected. These ribs are placed 12 ft. apart from centre to centre, and at a level of 8 ft. above Trinity high water at the springing, and 21 ft. in the crown. The webs of the arches are of ½ in. plate, except for the four bays close to the abutments, where they are 7½ in. and ½ in., with flanges, top and bottom, 20 in. wide by ½ in., and angle irons 3½ in. by 3½ in. by ½ in. The web is composed of two tiers of plates, each half the depth of the rib, and meeting at the centre in a line parallel to the flanges, where they are united by a cover plate, 6 in. by ½ in., placed on the inner side of the rib, and connected to it by rivets countersunk on the outer side.

In addition to this inner cover plate, there is at each abutment a T-iron, 6 in. by 4 in. by ½ in., placed on the outer side, so as to form a double cover plate for the rib in these portions of their length. The length of the web plates is about 12 ft., corresponding to the distance apart of the T-iron stiffeners, which are placed at intervals of 12 ft., and which, therefore, serve also as cover plates for the web. These T-iron stiffeners vary in size from 5 in. by 3 in. by ½ in. in the centre, to 5 in. by 3 in. by ½ in. at the springing, and are placed on the inside of the ribs, being bent, so as to pass over the