

into the stone. They are to be welded so as to be in one piece, and have eyes formed in them to receive the ends of vertical bars, and are to be made to receive a key at one end, and be screwed for a nut at the other. The nuts, keys and welds must in every case have a strength equal to the full section of the bar.

There are also to be vertical bars passing down through the second and third piers, and through eyes made for that purpose in both the upper and lower horizontal bars. The lower end of each of these vertical bars is to be screwed into a cast iron plate bedded in the concrete on which the stone work rests, and after passing through the upper bar they are to be screwed down tight before the masonry above them is laid.

If the vertical bars are not placed before the masonry is carried up, the holes made for them in the stones must be loosely filled with wooden plugs to guard against their being obstructed by mortar, etc.

Those stones at the springing of the fourth arch which can be laid before the first section of the cofferdam is removed, are to be fastened by straps and dowels in such a manner as to secure them, with a view of getting as much weight as possible on the third pier before the centres are struck or slackened.

The stones forming the lower part of the masonry are to be of large dimensions; those for the footings of both the abutments and piers must be in courses 18 inches in height, and generally from 16 to 20 square feet area of bed, and in no case less than 12 feet area of bed.

They must invariably be of the full height, and be picked, scabbled or otherwise dressed into regular blocks before being brought on to the work, and such as will lay throughout to horizontal joints not exceeding five-eighths of an inch, and vertical joints of not more than one inch and a quarter.

This, it is to be distinctly understood, applies to the whole of the two footing courses of each of the abutments, and to the three footing courses of each of the piers. The full width of the latter (the piers) must, in all cases, be made up of not more than two and three stones alternately.

For the third pier from the south end, the footing courses must be 20 inches in height and of still larger dimensions than those above mentioned, as the first or lowest course has a width of  $13\frac{1}{2}$  feet which must in like manner be made up with two and three stones alternately.

The second course of this pier, which, for a time will form an abutment, must be secured to the lower one by vertical bolts or joggles, and the stones be connected with each other by means of dowels of  $1\frac{1}{2}$  inch iron  $\frac{1}{4}$  inches long, let in horizontally.

The third or upper course of the footings of this (the third) pier must be made up of two stones in width, which will be the springing course for the arches on each side, and must therefore be formed into a skew-back; all the stones of which are also to be dowelled to each other, and secured to the course beneath with bolts or double joggles in like manner as the second course is to the first one.

All the other piers above the footings must be made up of two stones in width and 16 inches in height, arranged so as to form a bond of at least one foot on alternate sides as well as lengthwise of the pier.

The face of the stones must be dressed to a batter of one in twelve, and have their backs scabbled so that the joints between the two ranges of stone shall not exceed one inch.

The upper course in each of the piers is to be formed into a skew-back for the springing of the arches—the nose or thin part of all these stones must be at least four inches thick, increasing at the required angle.

The width of the pier must be made up of two stones, each  $3\frac{1}{2}$  feet wide. Their backs must be scabbled, picked or otherwise dressed so that the vertical joint between them shall not exceed one inch, and the course immediately below them must be so arranged that the skew-back will form a bond of at least 12 inches both longitudinally and transversely of the piers.

It is to be observed that the face of the upper footing course of the abutments and piers, on the side adjoining the arch, must in all cases be bevelled so as to over-