plates to give further stiffness. There are, as we have said, four columns in each pier, and these are connected by pairs of horizontal angle irons 3 in. by 3 in. by \( \frac{3}{4} \) in., and by diagonal lattice bars 4 in. by \( \frac{3}{4} \) in. At their bases the columns are bolted to suitable castings, which are secured to the masonry piers by holding-down bolts, while at the tops they carry castings on which the girders rest. Wrought iron has been used in these piers, as indeed in the whole of the superstructure, from the circumstance that cast iron was considered to be an objectionable material for the purpose on account of the extreme degree of cold to which it would be subject in a Russian winter. The columns are 20 ft. high, and rest on a pier formed of masonry with a brick core, 16 ft. high, and carried by 2 ft. of concrete laid on piling. The height from the bed of the river to the underside of the girders is 42 ft. The piers are built with cutwaters on the side facing the current as a protection against the floating ice, the dimensions of the piers being at the bases 37 ft. 4½ in. long by 11 ft. 6 in. wide.

The method of construction adopted by Messrs. Handyside was as follows: The ironwork was sent from England ready for rivetting up, the rivetting being done at the St. Petersburg end of the Nicolai Railway. A large space of ground adjoining the railway was granted to the contractors for a building yard, and there they established constructing sheds and appliances, a number of sidings being laid down for the work. Arrived at St. Petersburg, the girders were built up on railway wagons—of which more than 100 were in use—in sections suited to the length of the wagons, which themselves were long, being carried on a pair of bogie frames. It is this stage in the work of construction which is represented by Plate XIX., that plate showing the building yard of Messrs. Handyside and Co., with the railway wagons on which the girders are being built up ready for removal down the line.

As the work was finished, the wagons carried it to the site where it was to be used, the level nature of the Nicolai Railway, its freedom from sharp curves, and the absence of overhead bridges, rendering the line peculiarly suitable for this arrangement. Arrived at their destination, the trucks on one line of rails, and carrying one pair of girders, were run on to the bridge, and the girders lifted from off them by special tackle sent out from England. The wagons were then run back, and the girders were lowered into their required positions, each girder coming almost directly in the line of the rails as previously laid. By this arrangement the traffic was only stopped on one line of rails at a time during reconstruction, the second pair of girders not being laid until the traffic could be carried on over the first pair. The timber of the old structure was then removed, the platform made good, and the bridge was again ready for traffic on both lines, the interruption being thus only partial, and then of comparatively short duration. The whole of these arrangements were carried out by Messrs. Handyside and Co., to the joint satisfaction of the company's consulting engineer, General Kerбедs, their managing director, General Koenig, and their chief engineer, M. Wierszbowksi.