

shape of the pier to be built. These walings were placed at intervals to suit the pressure. The skeleton was then sunk into place and weighted down with steel rails. The walings referred to served a dual purpose; first as a guide to the sheet piling which was driven around them, and to receive the struts which were put in as pumping proceeded. Before any pumping was started, however, a second row of sheet piling was driven from four to five

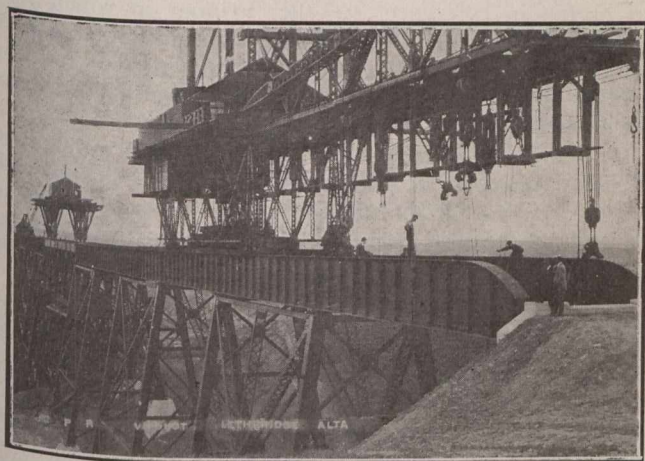


Fig. 20.—Erection Traveller Placing the Last Girder.

feet outside of the first row, and the intervening space was puddled.

From Fig. 14 a partly sunk skeleton is shown, and completed dams are shown on other parts of the work with both rows of piling driven, and one of the dams pumped out.

A third method was used where it was known to be impossible to pump out a cofferdam. Dredging was resorted to and continued until nothing further could be taken out by this method. An open caisson was then sunk into place, and as close to the shale as possible, and weighted down with old rails. Further preparation of the footing was made by divers. After a few feet of concrete had been placed in the bottom by bottom dumping buckets, the mass was allowed to set for a few days, and then pumping was resorted to. In the winter weather, steam was blown into the water near the bottom of the dam from boilers nearby, and this accelerated the setting up of the concrete. Little difficulty was found in pumping out any of the dams attempted in this manner, and after a dam was pumped out, it was a simple matter to place concrete.

The cement used was Buffalo Brand, made near Calgary, and the Exshaw Brand, made at Exshaw, Alberta. These cements were used and gave excellent satisfaction. One of the redeeming features of both brands was that they would set up fairly quickly, relieving to a great extent the pressure on the forms. When concrete was placed under water by means of bottom dumping buckets, a 1:2:4 mixture was used, and when water was not to be contended with, the concrete was of a 1:3:6 mixture.

A great deal of the gravel used came from the excavations along the river bottom proper, and was found with the proper proportion of sand, so that no screening

was necessary. This proved to be very profitable for the contractors, and in one of the river piers, sufficient coal was taken from one of the excavations to feed the boilers furnishing steam for several river piers. Fig. 15 shows the pedestals at the bottom of the valley, also work proceeding on the west bank.

The large house in the centre of the picture was perhaps one of the first houses of any importance built in the North-west. It was built previous to the North-west Rebellion of 1885, and occupied by Mr. E. T. Galt, the first president of the North Western Coal and Navigation Co., which was later the Alberta Railway and Coal Co. This is the same house that is shown on Figs. 1 and 2.

Fig. 16 shows river piers for bent No. 52, with the grading of the west bank in progress.

Fig. 17 shows the excavation for foundations at piers No. 60. The necessity for the exceptional depth for these foundations was to get clear of some sliding ground indicated by cracks shown in the photograph.

Fig. 14 shows the river work in progress during the winter of 1907. A cofferdam is seen at the bottom of the picture, being pumped out. This is the excavation from which the coal was taken out. The next cofferdam above has been sheet piled, ready for pumping. Beyond this, two of the skeletons previously referred to are shown; one has been sunk into place, and the other is being sunk.

Fig. 18 shows the east bank at the Lethbridge end of the viaduct. The pedestals on the side hill are shown completed, and one row on the river bottom partly completed.



Fig. 21.—Cantilever Arm of Traveller. Note the erection cage suspended at the top of the tower.

The erection traveller has been so fully described in Mr. Monsarrat's paper, that nothing further can be said. Fig. 19, however, shows the traveller, which is also shown on Figs. 20 and 21.

This was certainly a very elaborate traveller, and so complete that the Canadian Bridge Company, who erected it, could have done nothing further to manufacture a machine for handling the steel, and provide safety for