

Canadian Pacific Railway Bridge at Outlook, Sask.

Early this year the bridge across the South Saskatchewan River, near Outlook, Sask., on the C.P.R.'s Moose Jaw northwest line, was opened to traffic. The bridge in its several stages of completion is shown in the accompanying illustrations.

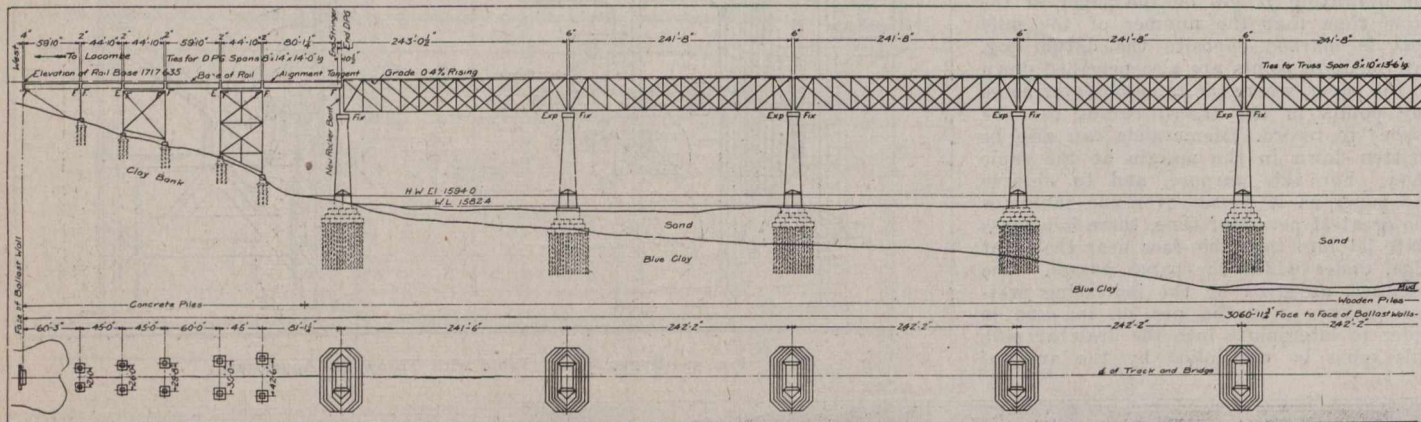
The prairie on both sides of the river at this point is nearly at the same level, at an elevation above the river of over 100 ft. It was, in consequence, decided to build a high level viaduct across the river, at the

All the river piers are carried on wooden piles, driven at a close spacing in the sand and clay of the river bed. The nature of the ground was such as to require extraordinary means in order to obtain a good foundation.

The river spans are all 240 ft. long, of the link pin construction, considerably lighter in design than is usual in present day work. This is accounted for by the fact that these eight spans are all from

Lawrence bridge. The shore spans are carried on steel bents, resting on concrete foundations. The latter are carried on concrete piles, instead of wood piles as used in the river construction. Two lengths of new shore spans have been employed, 45 and 60 ft., the latter size bridging between the steel towers. The bents are of varying length to conform to the shore foundation.

At the east end of the bridge the elevation is 1,729.65, and at the east end, 1,717.63. The normal water level is 1,582.4. Thus the maximum elevation above the river at the



C.P.R. Bridge Across the South Saskatchewan River at Outlook, Sask. (Continued on next page.)

level of the prairie, instead of making cuts on either side to bring the track level down nearer the river. This latter course would have necessitated heavy approaches in either direction, and it is questionable whether the heavy cutting required would have been any more economical from the standpoint of initial cost, apart from a consideration of the cost of operating trains over such a dip. The prairie level on both sides was such as to provide for a bridge

the company's old bridge across the St. Lawrence at Lachine, near Montreal. The new bridge at this latter point was rebuilt and double tracked last year, a description of the work appearing in Canadian Railway and Marine World for April, 1912. The old bridge was still in excellent condition, and did not require renewing, except for the fact that the line out of Montreal carries the heaviest rolling stock on the system, and the traffic is quite

west end is 147.25 ft., making the bridge one of the highest in Canada. With the total length of 3,004 ft., it is a bridge of considerable proportions.

Work was carried on through the winter of 1911-12. The river foundations were sunk by means of caissons, and it was in the use of the latter that some difficulty was experienced. The caisson in the deepest part of the river was completely washed away by spring freshets, occasioning some delay. On the piles sunk in the caisson, the concrete was built up in moulds. The lower part occasioned no difficulty, but with the upper section it was necessary to construct high elevators to raise the concrete to the elevated forms. The work was not delayed by the winter weather, as the concrete moulds were encased with an outer wooden wall, with an intervening air space between the two walls. In this space were run steam pipes to keep the mould warm for the proper setting of the concrete in the extreme weather encountered in that northern latitude. The methods of conducting the work in warm weather are shown in the illustrations, as is also the system of false work for erecting the main link spans.

The designs for the bridge were made in the office of P. B. Motley, M. Can. Soc. C.E., Bridge Engineer, Montreal, and the constructional work was performed under the supervision of J. G. Sullivan, M. Can. Soc. C. E., Chief Engineer, Western Lines, Winnipeg.



Completed C.P.R. Bridge Across the South Saskatchewan River.

with a uniform 0.4% rising grade from the west.

The central portion of the bridge consists of eight 240 ft. spans, on high concrete piers, with 45, 60 and 80 ft. shore spans, carried on bents. The concrete river piers are of a particularly heavy construction, and of a total height from the base of 125 ft. These were carried down to a sufficient depth to be free from frost and scour. The enormous size of these piers is shown in the accompanying illustrations.

dense, requiring a double track bridge. So while the old bridge was not considered suitable for its former service it was quite adapted for a branch line. It has therefore been moved to its new location in the bridge under description.

All the shore spans, save the three 80 ft. plate girders, one at the west and the other two at the east end of the bridge, are new, and have been designed to the latest main line specifications. The 80 ft. spans, like the longer river spans, come from the St.

A new axle train lighting system has been tried on the Santa Fe system, involving a number of radical departures. The inherent characteristic of the generator is that it gives the same polarity for either direction of rotation, eliminating the necessity for any pole changer. The variation in voltage is reduced to narrow limits and no lamp regulator is required. The system adjusts itself automatically to different conditions of load produced by variations of schedule or by change of season, so that no manual adjustment is required to meet these different service conditions. At the same time useless overcharge of the battery is eliminated, thus establishing conditions favorable to long battery life.