

44 ft. through girder span, four 80 ft. deck spans, and one 90 ft. lift span trunnion type. This bridge is designed for a double track. Base of rail to high water 15 ft., to low water 43 ft., to bottom of river 56 ft., and to rock 63 ft.

Our first steel bridge west of Winnipeg, on the main line, at mile 45, over the Assiniboine River, is 437 ft. 2 in. inside of parapet walls, composed of one 250 ft. through truss span and one 88 ft. through plate girder span at each end. Base of rail to high water 13 ft., to low water 22 ft., and to river bottom 34 ft.

We also cross the Assiniboine River at mile 203. This crossing is 255 ft. in-

On the same mile we cross the McLeod River with a bridge of 1,066 ft. 11 in. between parapet walls, composed of two 70 ft. end deck spans, four 210 ft. deck truss spans, two 40 ft. tower spans resting on two steel towers, one river span 80 ft. high and abutments. Base of rail to high water 107 ft., to low water 118 ft., to bottom of river about 122 ft.

At mile 930 we cross the valley of Prairie Creek with a bridge 802 ft. 2 in. between parapet walls, composed of two 70 ft. end deck spans, three 70 ft. and nine 50 ft. intermediate deck spans resting on six towers, one bent and two abutments. Base of rail to high water

river at miles 24.5 and 35.5 with similar spans. At mile 34 we again cross this river with a 66-ft. through plate girder span. Base of rail to high water 8 ft., to low water 13 ft., to bottom of river 15 ft.

On our main line from Prince Rupert east we have one bridge crossing the Zanardi Rapids at mile 8, 658 ft. 4 in. between parapet walls, composed of three 55-ft. through plate girder spans, two 125-ft. and one 225-ft. through truss spans. Base of rail to high water which is the highest tide, 7 ft. 6 in.; to low water 32 ft. 6 in., to bottom of river 43 ft. 6 in.

Outside of the above bridges, which are now complete, we have under construction or study about 40 more, one of the most important, now actually under construction, being at mile 164, Prince Rupert east, over the Skeena River.

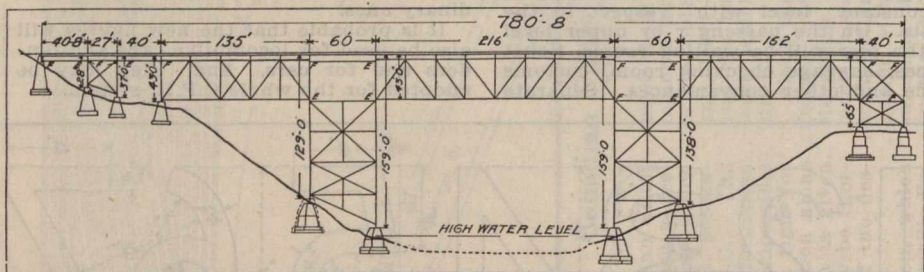
The foregoing paper was read before the Western Canada Railway Club recently.

The Canadian Northern Railway Bridge Over the Pembina River, Alta.

The route selected for the extension of the C.N.R. westward from Edmonton, Alta., towards the Yellowhead Pass, involves the construction of a couple of rather heavy bridges over the Pembina and McLeod Rivers, as these streams have eroded their channels far below the general level of the country. At the Pembina River the banks rise steeply from the water's edge without the usual river flats intervening between the channel and the terraced benches so often seen in deep river valleys; the absence of river flats at the Pembina River thus reducing the length necessary to be bridged.

The total length of steel work is 780 ft. 8 ins., the approach at the east end being 28 bents of the C.N.R. standard framed timber trestle 68 ft. in height. The river span is 216 ft. long, supported on steel towers on concrete pedestals, the span of these towers being 60 ft. The east and west flanking spans are respectively 162 and 135 ft. long, and the western approach is of viaduct construction.

The three truss spans are of the Pratt type, with rivetted connections, the panel spacing being uniformly 27 ft., the trusses are spaced 17½ ft. c. to c., and the depth of trusses is 36 ft. from centre to centre of chords. The floor beams rest on the top of the upper chord with bracket connections to chord at ends of floor beams.



Canadian Northern Railway Bridge over Pembina River.

Base of rail to high water 96 ft., to low water 111 ft., to bottom of river 117 ft.

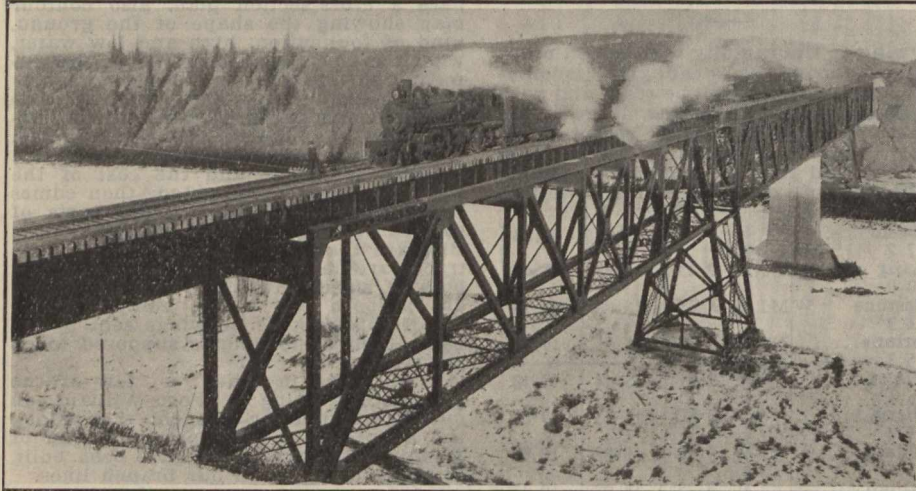
On the Alberta coal branch, which starts from Bickerdike, mile 932 west of Winnipeg, we cross the McLeod River at mile 6 with a bridge of 304 ft. of steel, with timber approach at each end. The steel part is composed of two 150-ft. deck truss spans, resting on masonry. Base of rail to high water 49 ft., to low water 62 ft., to river bottom 65 ft.

On the same branch we cross the Embarras River at mile 22 with an 80-ft. deck girder. Base of rail to high water 22 ft., to low water 28 ft., to bottom of river 30 ft. We also cross the same

The towers are designed to take care of all lateral and longitudinal stresses, and sufficient anchorage is provided to overcome any possible uplift. The live load for which the structure is designed is Class 1 of the Dominion Government specifications.

We are indebted to W. L. Mackenzie, Bridge Engineer, for the foregoing information.

The Timagami Steamboat and Hotel Co.'s hotel Lady Evelyn was burnt, July 4. The loss, which is estimated at \$30,000, is partly covered by insurance.



Grand Trunk Pacific Ry. Bridge over McLeod River, 914 miles West of Winnipeg.

side of parapet walls, and is composed of one 250 ft. through truss span. Base of rail to high water 8 ft., to low water 20 ft., to river bottom 30 ft.

At mile 468 we cross the South Saskatchewan River near Saskatoon with a bridge of 1,501 ft. inside of parapet walls, composed of one 175 ft. through truss span, five 225 ft. deck truss spans, one 125 ft. deck truss span, and one 50 ft. deck span. Base of rail to high water 52 ft., to low water 71 ft., to river bottom 75 ft.

At mile 675 we cross the big Battle River valley with a steel viaduct of 2,772 ft., and wooden trestle of 2,600 ft. The steel structure is composed of fifty-one 50 ft. deck spans, one 70 ft. deck span, and one 150 ft. deck truss span, resting on 26 steel towers and two abutments. Base of rail to high water 157 ft., to low water 184 ft., to bottom of river 190 ft.

At mile 786 we cross the North Saskatchewan River at Clover Bar, about nine miles east of Edmonton, on a bridge 1,655 ft. 5 in. inside of parapet walls, composed of two 50 ft. end deck spans, eight 50 ft. and four 40 ft. intermediate spans resting on seven piers, three 225 ft. deck truss spans resting on piers, and two 150 ft. deck spans resting on piers and tower. Base of rail to high water 106 ft., to low water 137 ft., to bottom of river 143 ft. The principal feature of this crossing is the four concrete river piers, which have an average height from the bottom of foundation to the top, of 120 ft.

At mile 861 we cross the Pembina River on a bridge of 902 ft. 2 in. between parapet walls, composed of two 60 ft. end deck spans, two 210 ft. and one 240 ft. deck truss spans, and two 60 ft. tower spans, all resting on two towers and masonry. Base of rail to high water 137 ft., to low water 208 ft., to bottom of river 224 ft.

At mile 914 we cross the Wolf Creek with a bridge 652 ft. 2 in. between parapet walls, composed of two 60 ft. end deck spans, two 40 ft. tower spans, and three 150 ft. deck truss spans, resting on two steel towers and masonry. Base of rail to high water 116 ft., to low water 125 ft., to bottom of river 130 ft.