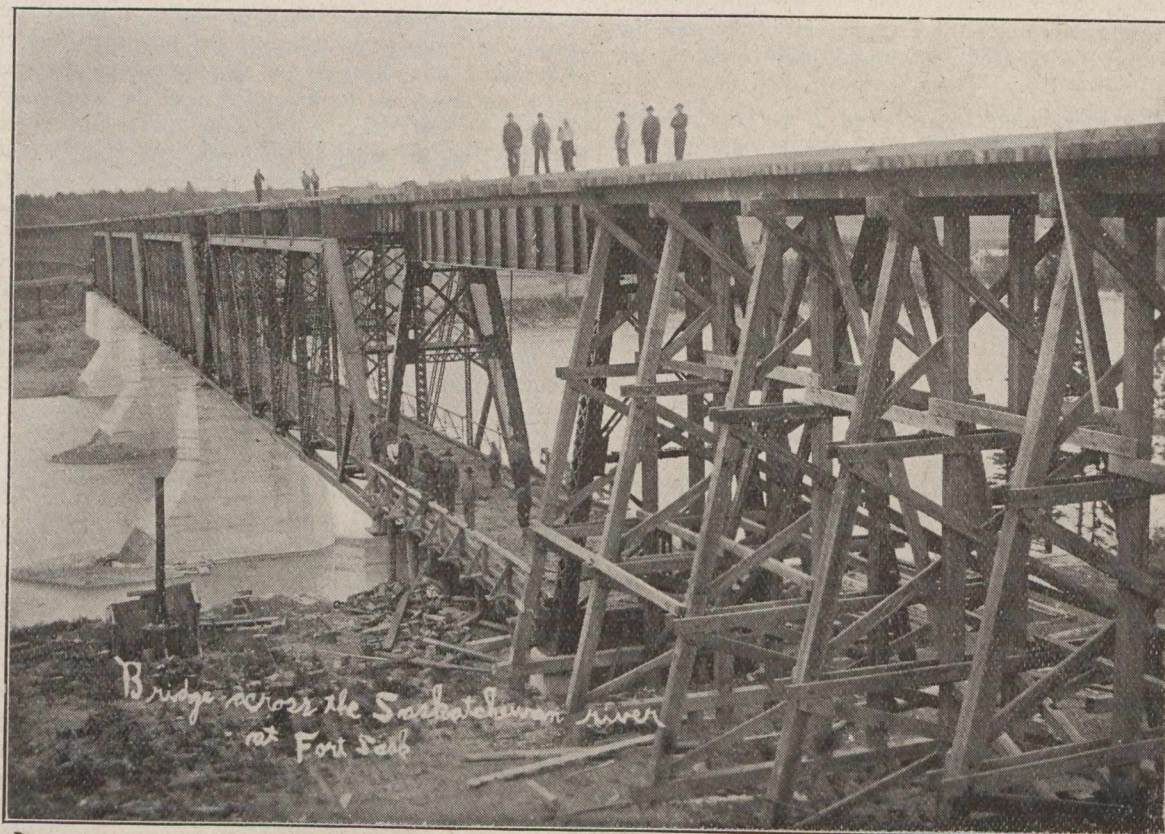


| | |
|---|-------|
| Belly River and tributaries | 1,095 |
| Bow River and tributaries | 1,515 |
| South Saskatchewan River | 155 |
| Red Deer River and tributaries | 2,580 |
| North Saskatchewan and tributaries..... | 3,225 |
| Athabasca River and tributaries | 6,015 |
| Beaver River (the headwaters of the Churchill River) and tributaries | 285 |
| Battle River and tributaries | 1,015 |
| Peace River and tributaries | 4,925 |
| Other rivers flowing into L. Athabasca | 345 |
| Slave River | 100 |

thus giving a total length of streams in the province of 21,990 miles, or safely over 22,000 miles.

It will therefore readily be seen that where within an area of 260,000 square miles there are 22,000 miles of streams and rivers interlacing the country in all directions,

material in bridges through the province has increased by leaps and bounds, and at present there is scarcely a structure of any magnitude that is composed of material other than steel. With the general introduction of steel into bridge work on the Canadian Railway systems came the heavier type of locomotives and rolling stock. The growth of the latter in fact predetermined the former, as the old wood structures would not meet modern demands of traffic. This has grown so that of late years the type of steel bridge now in service is much increased in weight and strength over that designed fifteen years ago. The weight of the modern locomotive to-day varies from 100 to 180 and in several cases 250 tons, loaded, which weight demands to support it a rigid and heavy type of structure. It does not follow, however, that these present weights of engines have caused to be produced a type of bridge that cannot be surpassed in strength to carry a still heavier loading, should other considerations not restrict a further increase in size of locomotives and rolling stock.



Combination Railway and Highway Bridge Crossing the North Saskatchewan River at Town of Fort, Saskatchewan.

neither railway or highway can advance far in any direction without having to cross some of these streams, necessitating bridges of more or less magnitude. As this paper will deal entirely with steel bridges and their substructures, the writer will not attempt to even summarize the numerous pile and timber trestle bridges now in existence through the province for both railway and highway purposes.

To the Canadian Pacific Railway Company belongs the honour of erecting the first steel bridge in Alberta, that crossing the South Saskatchewan at Medicine Hat. This bridge, erected about 1884, is still doing daily service and is apparently in a good state of preservation. Very few, if any, other steel bridges were erected during the construction of the C.P.R. main line west of Medicine Hat, and it is only within the past ten or fifteen years when the old timber structures demanded renewal that steel to any extent was introduced. However, within the last few years the use of this

The standard of loading now generally adopted in designing these structures is that specified by the Department of Railways and Canals and classified as "Heavy." This provides for an engine load of two consolidated type locomotives coupled together, each with a load on the pilot trucks of 25,650 lbs., on each of the four pair drivers a load of 49,400 lbs., and on the tender a load of 34,200 lbs. on each four pair of wheels, making the total load under engine and tender of 360,050 lbs. or 180 tons; these two locomotives to be followed by a uniform load of 4,750 lbs per lineal foot of bridge.

In some cases the bridges are designed for Class "Especial Heavy," which calls for loads on engines and tenders of 180 tons followed by a uniform load of 5,000 lbs. per lineal foot of bridge.

The class of bridge now generally erected to care for the above requirements is a solid riveted structure of either