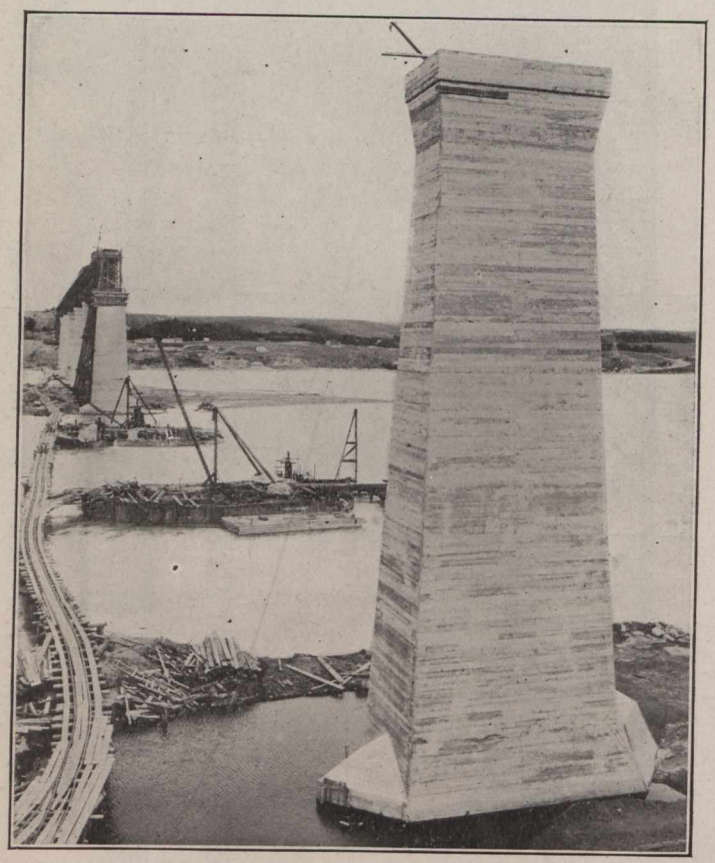
The south approach is a very interesting combination of towers and double deck trusses. The spans on the towers are 49 ft. 5 in. long and those between towers 97 ft. 8 in. long, with the exception of that connecting with the first river pier, it being 99 ft. 10 in. in length. As at the north end, the roadway is run clear of the centre line of the rail deck by girder spans. In this case, however, the roadway rises to the level of the rails some 250 ft. south of the first abutment. The railway leaves the embankment and enters a cut of considerable size before passing under Anthony Street, to the grade of which the street car tracks and roadway rise. Thus, with remarkable provision against traffic interference, the viaduct carries on its upper deck the single-track line of the C.P.R., with street car tracks spaced at 12-ft. 6-in. centres on either side, the necessary width being provided by floor beams extending out over the trusses; while on its lower deck the roadway, a creosoted wood block pavement on reinforced concrete foundation, runs between the trusses and 8-ft. sidewalks are cantilevered on the outside.



**One of the Concrete Piers of the C.P.R. Bridge at Outlook, Sask., While Under Construction.**

The four piers carrying the three river spans (the rail level of which is over 150 ft. above mean water level) are massive structures carried below the river bed to rock foundation. The towers rest on concrete pedestals supported by concrete piles.

### The Bridge at Outlook, Sask.

The line of the Canadian Pacific Railway running northwest from Moose Jaw, Sask., crosses the South Saskatchewan River near Outlook by a high-level bridge built in 1911 and 1912. This is another handsome steel structure supported on massive piers of concrete, the approaches being in each case a steel trestle supported upon concrete pedestals.

The main spans above the river consist of eight 240-ft. long deck double intersection truss spans weighing approximately 4,052,000 pounds. The trusses are at 16-ft. centres. The steel trestle approaches consist of three 80-ft. and seven 60-ft. open spans and nine 45-ft. tower spans. The girders of these approaches are at 10-ft. centres and the legs of the towers have a batter of 1 in 6. Both trestle approaches rest on pedestals supported by concrete piles. Common to both approaches is what is generally known as "stiff" construction with riveted connections, there being no rods or pins in the work.

The river piers are supported on wooden piles driven to refusal in the sand and blue clay formation underneath. The substructure work was carried out under extreme flood and temperature difficulties. Several of the tall piers had to be constructed inside of specially built housing under artificial heat.

The total length of the bridge from face to face of ballast walls is 3,004 ft. and the height above river bottom in the deepest place is approximately 150 ft. The total weight of steel used is in the neighborhood of 6,000,000 pounds, while the total yardage of concrete in the piers and pedestals amounts to about 33,500 cubic yards.

The deck of the bridge consists of the usual Canadian Pacific Railway standard ties and guard rails, and the river spans have their top chords projecting about 16 ins. above the base of rail, forming an additional safeguard should a train become derailed on the bridge.

A general elevation diagram of the structure is shown herewith. The massiveness of the concrete piers is evidenced by the illustration of one of them, and the extremely interesting appearance of the bridge in general, notwithstanding the difficulties of climate and geology which handicapped its construction to a certain extent, is shown by the accompanying views.

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## LONGEST AERIAL TRAMWAY.

The longest aerial tramway in the world, by about 13 miles, is at present under construction as a feeder line to the Dorado Railway in Columbia, South America. It runs to Manizales from the Magdalena Valley, having its lower terminus at Mariquita. The air-line distance between the two terminals is 46 miles, although, owing to the very rough formation of the ground over which the ropeway passes, its actual length of cable is considerably more than this. The altitude of Mariquita is roughly 460 meters above sea level, and the highest point over which the ropeway passes is 3,675 meters, coming down again to 2,062 meters at Manizales. The line will have a carrying capacity for mine supplies and freight of all kinds of 10 tons per hour, but is being so constructed that this capacity may be doubled with slight alterations, if the necessity arises. The ropeway is naturally divided into sections, being driven at eight points. Most of the traffic will be through, both ways, between Mariquita and Manizales. There are, however, various points on the line where traffic will be picked up or unloaded, notably at four stations, Fresno, Soledad, Agua Catal and Esperanza. There is some exceedingly bad ground covered by the ropeway in the section already opened to traffic, which necessitates spans being worked up to 880 meters in length. Ropeways, Limited, of London, England, designed and supplied this line for the Dorado Railway Ropeway Extension, Limited, the consulting engineers being Sir Douglas Fox & Partners.