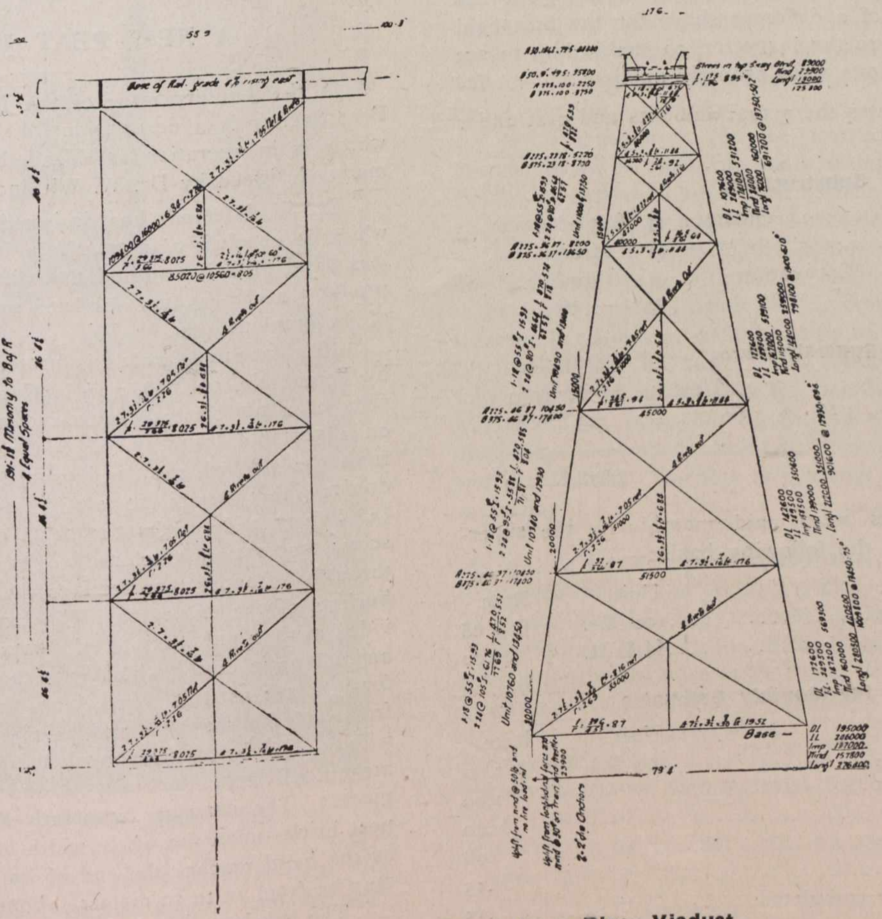
obtained on the bank of the river near the bridge site. In this locality good sand is very difficult to obtain, and, after a test of sand from several pits, the local material was selected, the sieve test showing after the gravel was screened out:—

Retained on 20 mesh sieve........	64 per cent.
" " 30 " "	17 " "
" " 50 " "	15 " "
" " 74 " "	2 " "
" " 100 " "	2 " "
	100%

After treating the finer residue with a 20% solution of sulphuric acid, it was found to contain 6% of soluble matter, which was eliminated by thorough washing, and a mixture of one part cement, two parts sand, and four parts gravel, varying from the size of a pea to three inches was obtained. As the sand was not of the best quality, the use of 1:2:4 mixture was ordered in shafts of pedestals, since they have to sustain a high concentrated load on a comparatively small volume of concrete. The concrete used in the buried pier and foundations was a 1:3:5 mixture. In obtaining a proper facing mixture the coarser material was kept away from the forms by the use of perforated spades, pushed down and drawn back while the mixture was still plastic. This method was found more satisfactory than that of attempting to bond a facing mixture into the body as required in some specifications.



A Typical Bent on the Little Salmon River Viaduct.

The Dominion Government specifications were strictly adhered to in the proportioning of the members. The compression members were figured for the pin ended formula of these specifications. In the tension members of the towers a limiting length of 200 $\frac{l}{r}$ was used to avoid sagging of members, to make them capable of resisting compression and to give initial stiffness. Attention is called to the use of bulb angles in the sway bracing of towers, which make a very stiff and economical section and avoid breakages in shipment. the great fault in box laced section of light angles. Traction and wind were figures as called for in the specifications.

The posts viewed from the stress sheets do not appear to be economical because of their relatively small radius of gyration when compared with a built up channel section; but the saving in weight of details and simplicity in shop work fully compensates for the extra main material. In the light of column tests it is reasonable to expect that the reduction in unit stresses for the increase of radii length would not be justified by practical tests. The metal is used mostly in directly resisting the primary stresses, as very little is required for secondary purposes (viz., lattice tie plates, etc.), and in this way a stronger column is obtained. The section used has also the advantage of continuous webs in each direction, which are greatly superior to the easily bent lattice bars, and moreover the interior of the column is much more accessible to the paint brush for shop and field coats. The section is symmetrical on both axes. having therefore its centre of gravity in the centre of the section, and no eccentric loading is induced from the girders. The small amount of redundant metal means uniformity of stress in the columns, and simplicity in the make up will decrease the cost of maintenance.

In calling for tenders for the steel work our usual practice was followed of furnishing bridge companies with a general design and details of girders and towers, together with a printed form of tender in which was filled in the estimated weights of steel, and number of feet B.M. of timber in the floor. With this system all bridge companies bid on the same basis, and are not required to make a single drawing to submit with tenders, but merely to fill in the unit prices for steel and timber erected in place, and to carry out the amounts on the estimated quantities furnished, viz., steel 14,000,000 lbs., timber 520,300 ft. B.M. After the tender is awarded the bridge company submit stress sheets and details for approval before ordering the material from the mills.

The rails were directly supported by 8-in. by 12-in. by 14-ft. bridge ties resting on the steel stringers, every fourth tie being 16 ft. long to support the plank footway placed outside the guard timber for the convenience and safety of the section men. An outside guard timber 8-in. by 9-in. dapped 1 in. over the ties, which were spaced four inches apart in the clear, the ties were secured to the stringers by ¾-in. hook bolts, and the guard timbers bolted through the tie with one ¾-in. bolt in every fourth tie. A steel guard rail 60 lbs to the yard will be placed inside the gauge line and eight inches therefrom in the clear, these guard rails coming together at the centre of the track one rail length beyond the end of the bridge and being protected by a cast steel point fitting the rail section and spiked to the road-bed ties.