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IVa

Free Discussion

Discussion libre

Freie Diskussion

D. VANDEPITTE

I would like to comment on Mr. de Noronha's paper bearing the title "A concrete beam for longer spans".

It would be interesting to modify the structure described in the paper by anchoring the two cables to both ends of the concrete superstructure in the final stage of construction. In this way the two anchorage blocks on the banks of the river and the ballast, which are very important structures in their own right, would be required only as temporary ancillary components and perhaps could be designed a little more economically for that reason. Moreover, transferring the cable pull from the anchorage structures to the ends of the concrete superstructure would in effect induce a considerable and very desirable prestressing force into the superstructure, enabling it to carry the live load more easily as a prestressed instead of a reinforced beam.

My second remark refers to the sag of the cable. If it is as small as suggested by the fact that the cable remains inside the concrete cross section, whose depth may be of the order of magnitude of, say, $\frac{1}{30}$ of the span, then the horizontal forces to be resisted by the anchorage structures, temporary or permanent, are enormous for spans in the range of 150 tot 450 m mentioned in the paper. It is as if a suspension bridge, and a concrete one at that, were designed with a cable sag to span ratio of less than $\frac{1}{30}$. The cost of the anchorages would be prohibitive in almost all cases. Therefore it would be better to design the cables with a much larger sag, say $\frac{1}{10}$ or $\frac{1}{8}$ of the span length, a sag to span ratio, that increases with the span length, in fact, and to suspend the precast concrete blocks from the cable. One of the slides shown be Mr. ^{de}Noronha went part way in that direction.

These two modifications together result in a prestressed concrete suspension bridge, whose concrete beams can have a depth to span ratio of about $\frac{1}{50}$ or less, depending on the span length, as shown by several bridge structures of this type actually¹ built in Belgium.

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