CORRESPONDENCE.

[This department is a meeting-place for ideas. If you have any suggestions as to new methods or successful methods, let us hear from you. You may not be accustomed to write for publication, but do not hesitate. It is ideas we want. Your suggestion will help another. Ed.]

DESIGNS FOR QUEBEC BRIDGE.

Sir,—Having had opportunities to note the progress of the erection of the Quebec Bridge during 1906-7, and also of being on the ground after the disaster, the writer has taken more than ordinary interest in that great national work, and, in view of the probability of rebuilding the structure, begs to submit a design and a brief article embodying a few condensed facts and views as they appear to him.

Sketch B shows a design and layout which would meet existing conditions on the ground, and give the public the desired assurance of safety.

The proposed design provides for braced towers similar to the Forth Bridge (except transverse batter and the number of piers), necessitating one new pier under each tower.

The tower could vary in length from 175 feet to 200 feet to suit conditions at end of bridge. The anchor arms remain same length as in original design, and also the suspended span. This would bring the ends of anchor arms approximately on the land abutments. To carry out this plan, the approach spans of 210 feet each must be eliminated. These approach spans could be cut out, removed to new site and erected at probably one-third of their original cost; or possibly lowered intact on blocking to tide water, and towed on scows to some convenient site.

A glance at Sketch A. (Comparative designs) will convince one of the superiority of the Forth design over the ill-

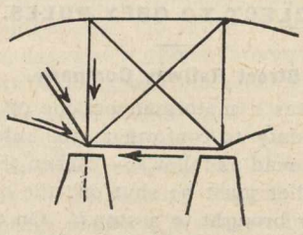
fated single post. The advantages of the former in erection cannot be overestimated—it is a design especially providing for erection stresses, a feature lacking in the original.

Note Sketch C,—the shaded portions of the two towers—the enormous overhanging load U U L of the Forth design (approximately 200 feet, nearly 2,000 tons), causes no stress in the lower chords, this stress being transmitted direct to pier through compression members P., leaving the lower chords free to take up stresses developing from further projection and suspended span.

In the original design the corresponding load, together with the lower half, passes through the lower chords.

The former exhibits the essential feature in erection—which determines the success of the structure.

Further.—One post of each tower of the Forth Bridge is anchored to the pier by forty-eight 2½-inch rods built into the body of pier. This, for all practical purposes, fixes each tower and makes each half tower self-supporting against such stresses as may develop in members directly supported by the two posts or half tower, and enables the piers to absorb the stresses or thrust direct-resolved as:



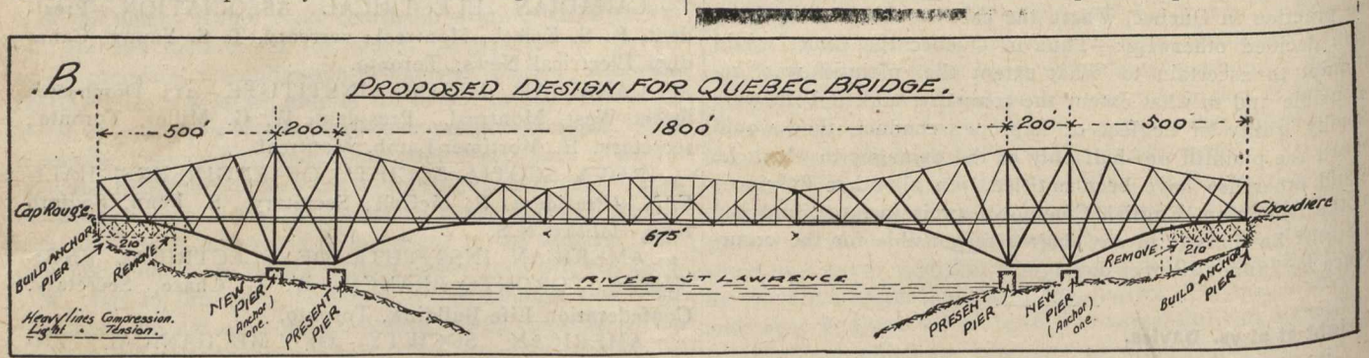
and prevents any excess stress in lower members of one arm of cantilever being transmitted to lower members of the other arm, and for erection purposes the advantages are manifest.

The above will upset some mistaken theories extant on this point.

Conditions were not similar with the Quebec structure nor practicable to such a degree.

It is apparent the erection stresses in the original design were under-estimated.

Had it been possible to erect the structure on falsework and join the chain of eyebars of the upper chords of cantilever with the members of the suspended span results would



have been entirely different—the immense chain of eyebars would have taken their proper initial loading, and such stresses as caused the failure of the Quebec Bridge would not have developed.

Following the method of erection adopted, the fact of successfully connecting or coupling up such a design of such a span would not relieve the lower chords near main posts of their already acquired loading, and should not be accepted as positive proof that the structure is a safe one. The recent failure should be sufficiently convincing of this.