

SUSPENSION BRIDGES

Suspension bridges are frequently constructed in preference to other types of bridge, especially where relatively light traffic has to be carried over long spans, since they are more economical in material and are extremely strong. There are in existence suspension bridges with main spans of more than 3000 feet, the entire weight of the deck being supported from above by cables (usually only two or four in number) suspended between two towers at either side of the river.

The cables are composed of thousands of wires, made of high-tensile steel, which are galvanised to resist corrosion. Two or three hundred of these wires, each of about 0.19 inch in diameter, are clamped together *to form* a single strand, and the whole cable may consist of a considerable number of such strands compacted and bound together with wire. In constructing the cable, two distinct methods may be adopted. The wires may either be twisted into strands, the strands then sometimes being twisted round a central strand *to form* the completed cable, or they may be spun parallel to each other, and clamped together at intervals. This latter method obviously involves a much longer spinning operation, since each wire or small group of wires must be spun and adjusted to the correct sag individually, whereas the strands of twisted wire can be erected as units, provided that they are not so heavy as to be unmanageable. However, on bridges with very long spans, there are certain advantages in the parallel wire method of spinning the cable.

The cables are normally made continuous through the tops of the towers, down through side towers, where these exist, and thence into the anchorage. They bear on specially constructed saddles on the towers, which are shaped to accommodate them, the saddles being either fixed so that the cables may slide over them, or mounted on rollers so that they move with any movement of the cables. In view of the enormous pull exerted by the heavy cables, their ends must be secured in firm anchorages, and unless they can be embedded in sound natural rock, constructions of masonry or concrete must be provided strong enough to withstand the severe pressures put upon them. The cable strands are normally looped round strand-shoes, which are in turn connected by chains to an anchor-plate embedded in the base of the anchorage.

At intervals along the main span, cast-steel cable-bands are attached to the cables, gripping them firmly and excluding moisture from them, and from these bands suspenders of wire-rope or chains hang down. Since these suspenders have to take the weight of the deck to which they are attached, they must have a high tensile strength. One advantage of using the braced-chain suspenders is that they largely dispense with the need for a system of stiffening, being themselves rigid. This stiffening is necessary to resist deformations of the deck of the bridge due to moving traffic loads and also to resist lateral pressures from wind. In the case of wire-rope suspenders, the stiffening must be provided by trusses constructed at the level of the deck, the depth of the truss varying with the length of the span.

1. Comprehension

- A. What impression is expressed by the writer about suspension bridges?
- B. Collect expression of measurements scattered over the second paragraph.
- C. Suggest a suitable topic for the third paragraph.
- D. Identify an expression of possibility in the second paragraph.
- E. What are two types of cables and what are they made of?
- F. How are ideas organized in this text?
- G. What do you mean by 'stiffening'?
- H. What might be the suitable topic of the paragraph that is to come after the last paragraph of this text?

2. Short questions

- A. How are cables constructed and used in suspension bridges?
- B. Write a summary of this text.

3. Long/ Discussion questions

- A. Considering the topography of Nepal, table about importance of suspension bridges.
- B. Ropeways are better than suspension bridges in context of Nepal'- common on this . You can agree, disagree or both.