STEEL BRIDGES

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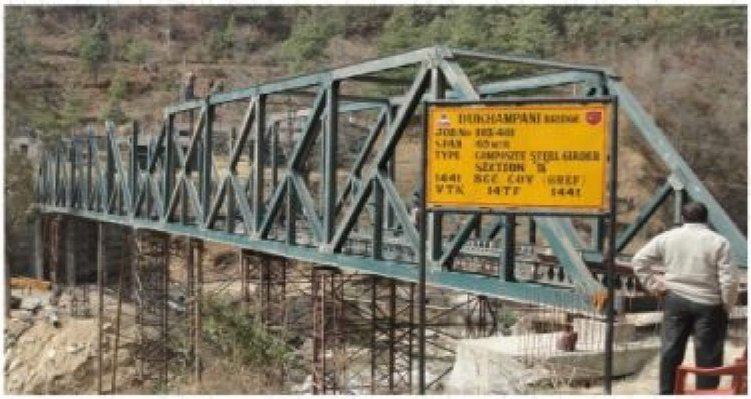
The main advantages of structural steel over other construction materials are its strength and ductility. It has a higher strength to cost ratio in tension and a slightly lower strength to cost ratio in compression when compared with concrete. The stiffness to weight ratio of steel is much higher than that of concrete. Thus, structural steel is an efficient and economic material in bridges. Steel is indeed suitable for most span ranges, but particularly for longer spans.

ADVANTAGES

- The following are some of the advantages of steel bridges that have contributed to their popularity in Europe and in many other developed countries.
- They could carry heavier loads over longer spans with minimum dead weight, leading to smaller foundations.
- Steel has the advantage where speed of construction is vital, as many elements can be prefabricated and erected at site.
- In urban environment with traffic congestion and limited working space, steel bridges can be constructed with minimum disruption to the community.
- Greater efficiency than concrete structures is invariably achieved in resisting seismic forces and blast loading.

  The life of steel bridges is longer than that of concrete bridges.
- Due to shallow construction depth, steel bridges offer slender appearance, which make them aesthetically attractive. The reduced depth also contributes to the reduced cost of embankments.
- Corrosion in steel bridges can be effectively minimised by employing newly developed paints and special types of steel. These techniques are followed in Europe and other developed countries.
- Steel construction has better quality control as compared to concrete construction.



TECHNICAL PROPERTIES

Many different types of structural systems are used in bridges depending upon the span, carriageway width and types of traffic. Classification, according to make up of main load carrying system, is as follows:

Girder Bridges - Flexure or bending between vertical supports is the main structural action in this type. Girder bridges may be either solid web girders or truss girders or box girders. Plate girder bridges are adopted for simply supported spans less than 50 m and box girders for continuous spans upto 250 m. Cross sections of a typical plate girder and box girder bridges are shown in Fig. 2(a) and Fig. 2(b) respectively at the back page. Truss bridges [See Fig. 2(c)] are suitable for the span range of 30 m to 375 m. Cantilever bridges have been built with success with main spans of 300 m to 550 m.

Girder Bridges as shown in Fig. 3 (at the back page) are divided into simple spans, continuos spans, suspended and cantilever spans.

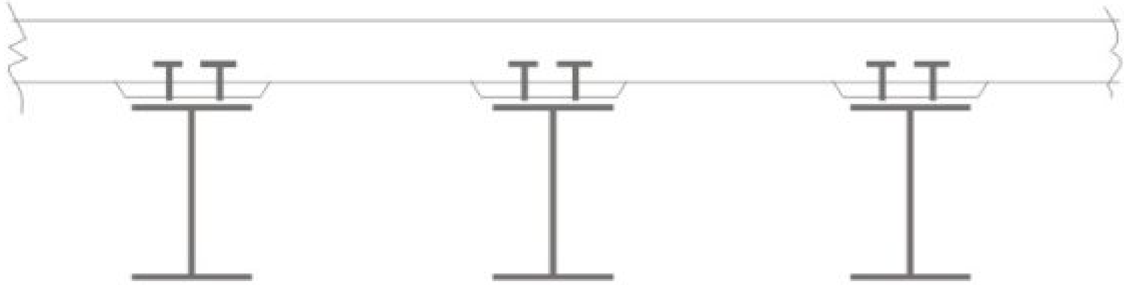


Fig. 2(a) Plate girder bridge section

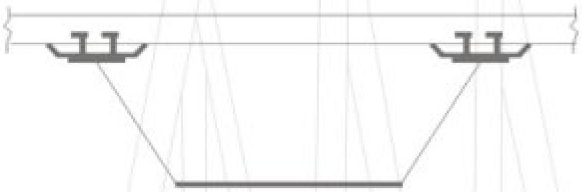


Fig. 2(b) Box girder Bridge Section

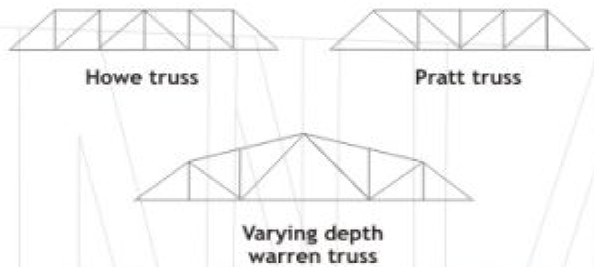


Fig. 2(c) Some of the trusses used in steel bridges

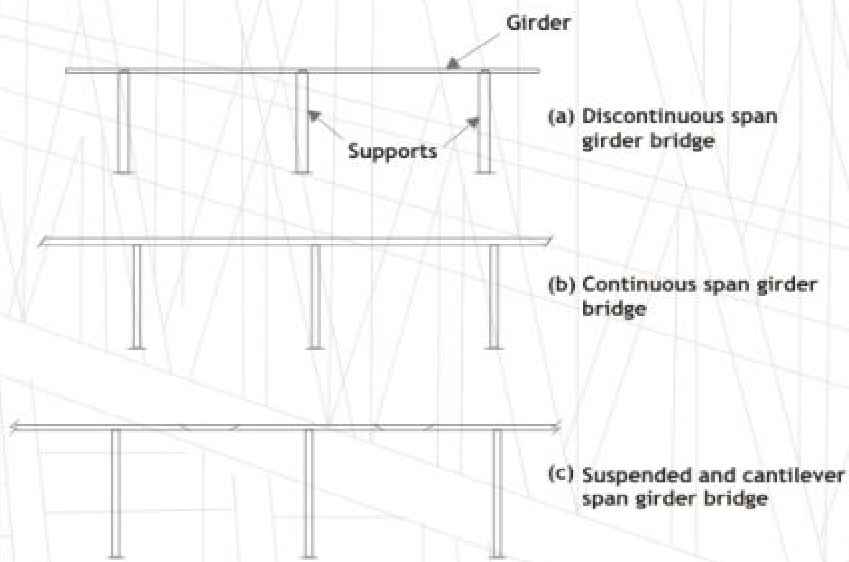


Fig. 3 Typical girder bridges

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