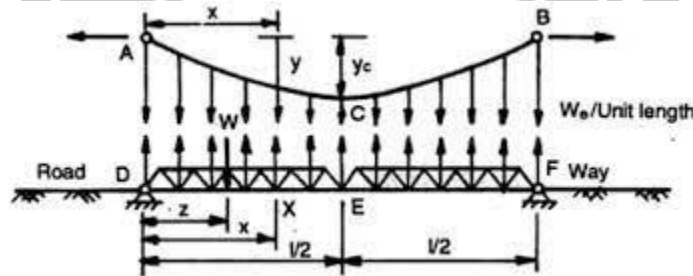


STIFFENING GIRDERS

Girder

Stiffening girder are the major load bearing members in suspension bridges. As they are flexible, they change their shape with the nature and position of the moving live load on deck slab.



Functions of stiffening girder

- They help in keeping the cables in shape
- They resist part of shear force and bending moment due to live loads.
- The cables take directly the dead load of the girder.
- The dead load of the girder does not cause any shear force or bending moment in the girder.
- The stiffening girder are subjected to shear force and bending moment due to live load and they should resist them safely.
- Stiffening girder allow the suspension bridge deck to remain in its actual position even after the application of load.

Types of stiffening girders.

- Two hinged stiffening girder
- Three hinged stiffening girder

Two hinged stiffening girder

- a. These are used to decrease the sag under the rolling load.
- b. Suspension cable bridges are stiffened with two hinged stiffening girder to make them stiff.
- c. These structures are statically indeterminate and by using energy methods, the forces in the cable may be obtained.
- d. When the girder is assumed to be rigid, the load at any position is transferred in the form of UDL.

Three hinged stiffening girder

- a. If the bridge is stiffened with three hinged stiffening girder, it maintains its parabolic shape during the movement of loads over the bridge.
- b. If moving the loads are involved, then the cable are assumed to carry uniform load and hence the stiffening girder will be subjected to bending moment and shear force.