

Tension Members

Steel tension members are those structural elements that are subjected to direct axial tensile loads, which tend to elongate the members. Tension members are probably the most common and efficient members in steel structures. They occur as components of trusses, bridges, wind bracings and transmission towers. Types, limiting slenderness ratio, behaviour and failure of tension members are discussed further.

Types of Tension Members

A tension member may consist of a single shape or may be built using a number of structural shapes (compound members). A brief of different scenarios where different sections are used is given below. Structural T-Sections - chord members of lightly loaded structures Structural I-Sections, channel sections, and built-up sections - used when greater rigidity is required i.e., in bridge construction

Rods and bars - in bracing systems Wire (single continuous element cold drawn from a hot-rolled rod) - used as guy wires in suspension bridges

Limiting Slenderness Ratio of Tension Members

Although stiffness is not required for the strength of a tension member, a minimum stiffness is stipulated by limiting the maximum slenderness ratio of the tension member. This limiting slenderness ratio is **required in order to prevent undesirable lateral movement** or excessive vibration. Maximum values of effective slenderness ratio as per IS 800 is given below.