



SNS COLLEGE OF TECHNOLOGY

AN AUTONOMOUS INSTITUTION

**Approved by AICTE New Delhi & Affiliated to Anna University Chennai
Accredited by NBA & Accredited by NAAC with “A++” Grade, Recognized by UGC**

COIMBATORE

DEPARTMENT OF CIVIL ENGINEERING

19CET304-DESIGN OF STEEL STRUCTURES

III YEAR / VI SEMESTER

Unit 4 :DESIGN OF FLEXURAL MEMBERS

Topic 2- Classification of cross sections

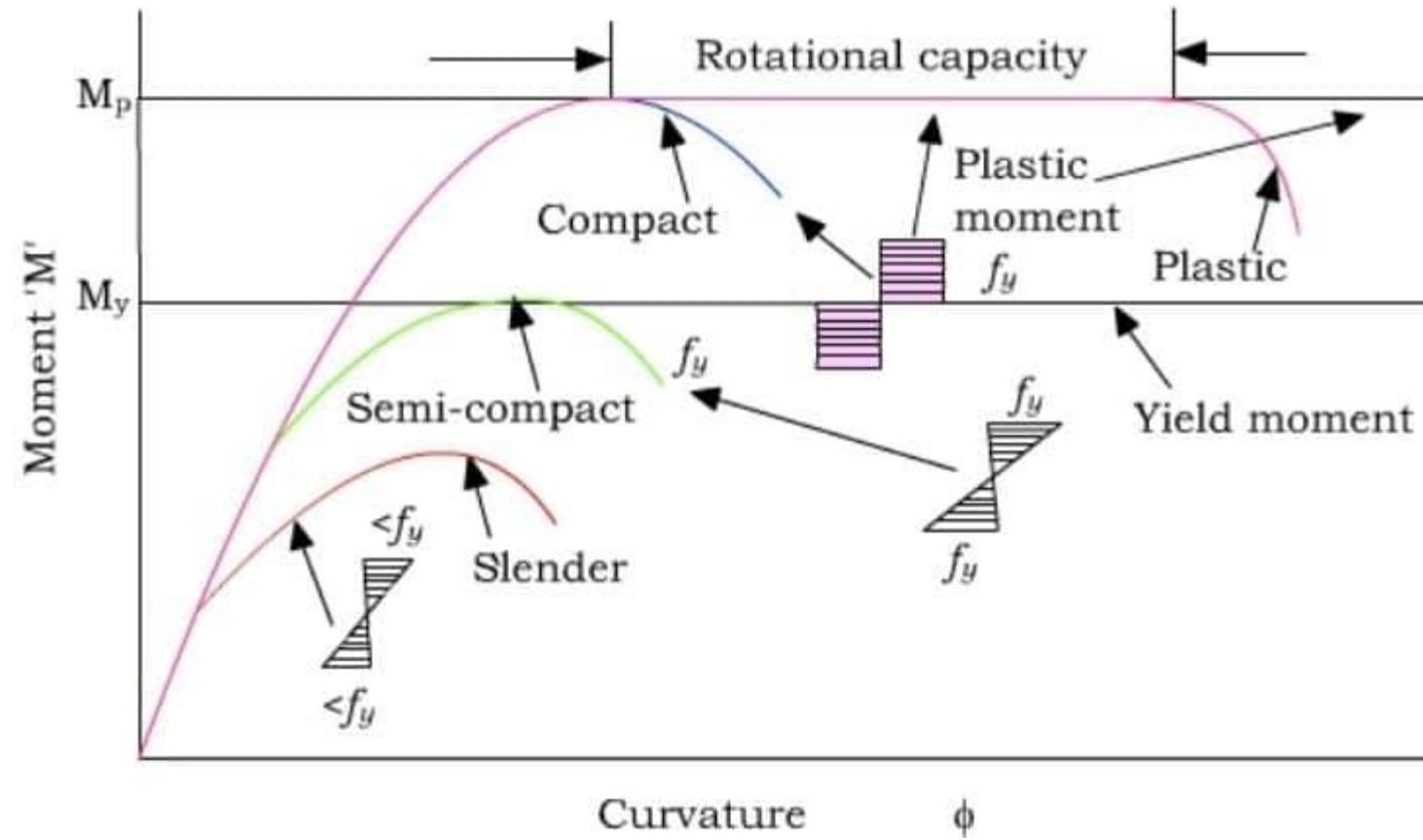


DIFFERENT TYPES OF STEEL CROSS SECTIONS

As per IS 800-2007, the classification of the steel cross sections depends on the load that the section can carry before failing, local buckling, moment redistribution capacity and the width to thickness ratio of the sections in consideration.

The steel cross sections are mainly classified into four types based on the above criteria as per IS 800-2007.

- 1. Plastic section*
- 2. Compact section*
- 3. Semi-compact section*
- 4. Slender section*





1. Plastic Section

- The plastic section is capable of developing plastic moment and plastic hinges with sufficient rotation capacity *without local buckling*.
- These sections can take load until a failure mechanism, which is beyond the plastic moment, by redistribution of moments.

2. Compact Section

- These sections can develop the plastic moment but the plastic hinge rotation capacity is inadequate because of local buckling. Hence, it fails even before developing a plastic mechanism.
- There is no redistribution of moments here. The width to thickness ratio of plate elements is greater than that of Plastic sections.



3. Semi-Compact Section

- The extreme fibre stress attains yield stress but cannot develop plastic moment.
- The maximum moment it can attain is Yield Moment. The member fails by local buckling even before it forms a mechanism.
- The width to thickness ratio of plate elements is greater than that of Compact sections.

4. Slender Section

- Even the extreme fibre does not reach yield stress in these sections. The width to thickness ratio is very high that the elements buckle locally even before reaching yield stress.
- These sections can not attain the yield moment.



THANK YOU