Tension Member Design

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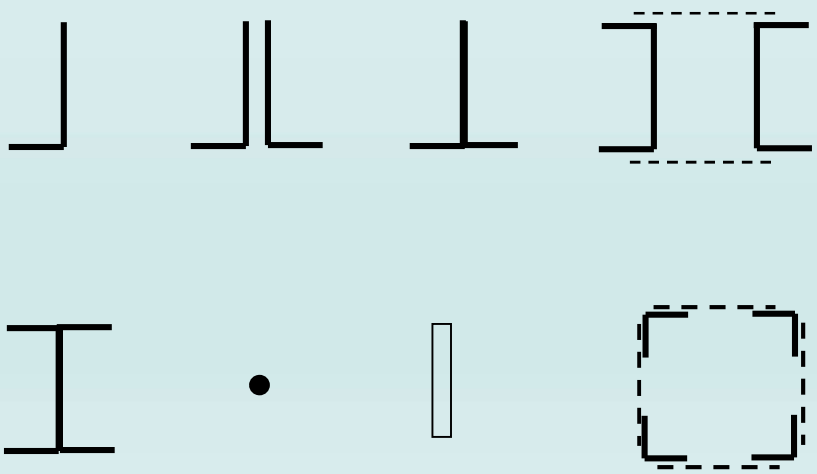
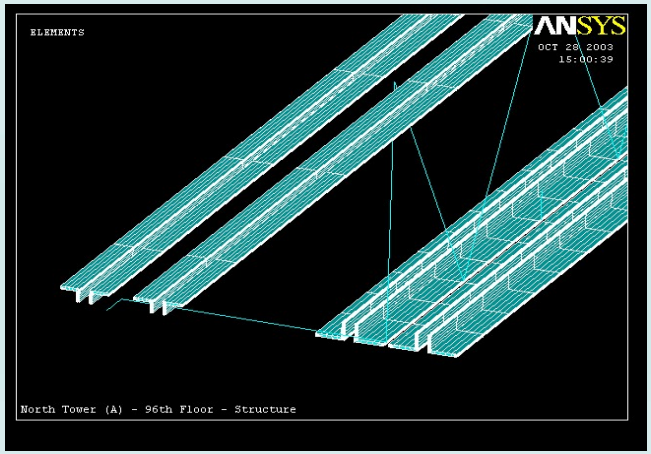
Tension Members

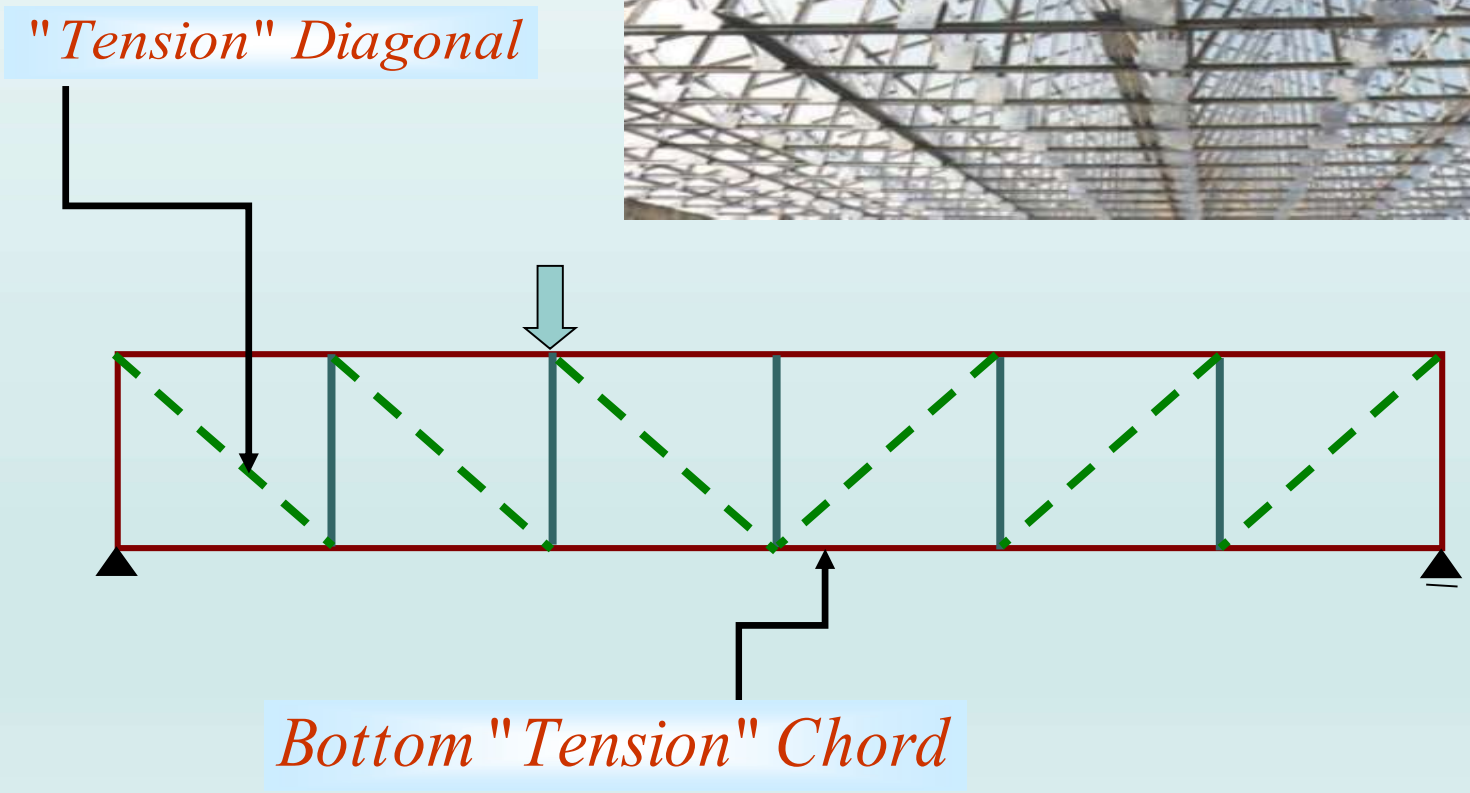
- Applications
- In bridge, roof and floor trusses, bracing systems, towers, and tie rods
- Consist of angles, channels, tees, plates, W or S shapes, or combinations





Typical Tension Members

- Tension chord in a truss

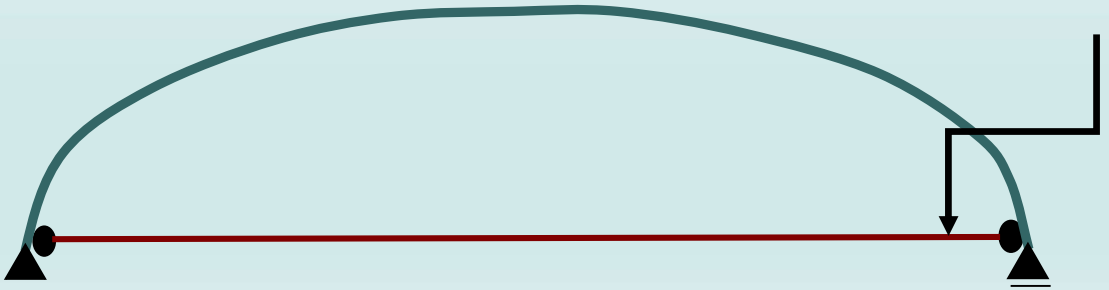


Typical Tension Members

- Cables

- Ties

"Tension" Tie



Tension Members

- Commonly Used Sections:
  - W/H shapes
  - Square and Rectangular or round HSS
  - Tees and Double Tees
  - Angles and double angles
  - Channel sections
  - Cables

Introductory Concepts

- Stress: The stress in the column cross-section can be calculated as

$$f = \frac{\mathrm{P}}{\mathrm{A}}$$

f - assumed to be uniform over the entire cross-section.

P - the magnitude of load

A - the cross-sectional area normal to the load

- The stress in a tension member is uniform throughout the cross-section except:
  - near the point of application of load
  - at the cross-section with holes for bolts or other discontinuities, etc.