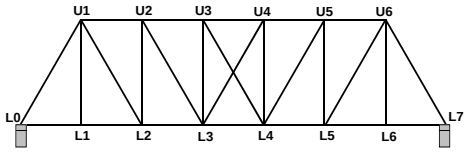
Structural Considerations for Trusses

Introduction

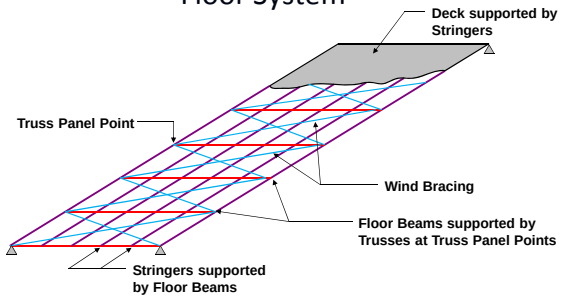


Pratt Truss

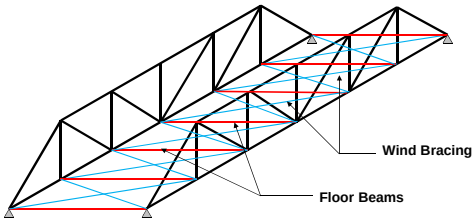
Truss Types

- Three types of trusses in Alberta:
  - Pony trusses
  - Through trusses
  - Deck trusses
- Traffic loads are transferred to the trusses by a floor system.

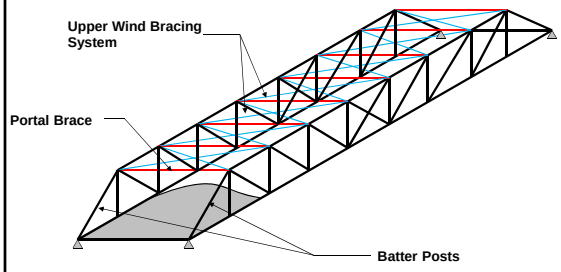
Floor System



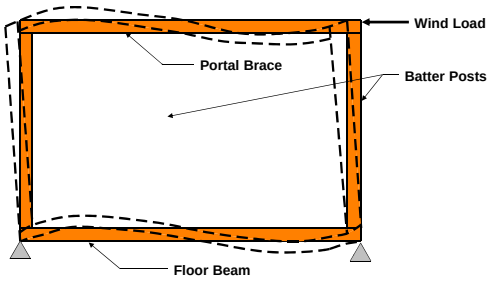
Pony Truss



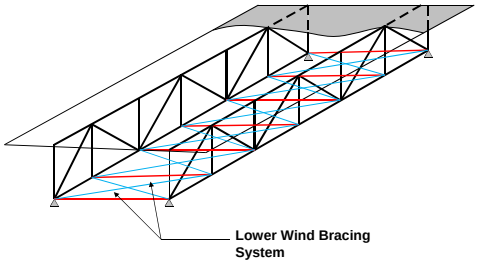
Through Truss



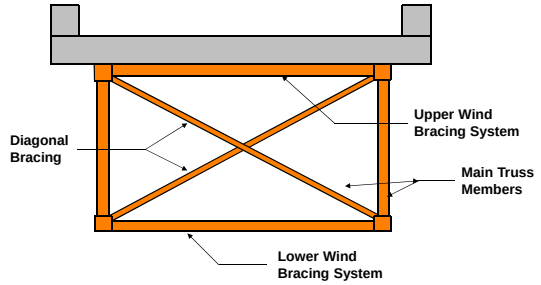
Portal Brace & Batter Posts



Deck Truss



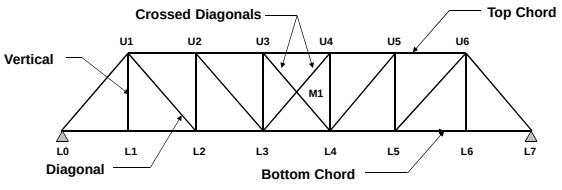
Deck Truss – Wind Bracing



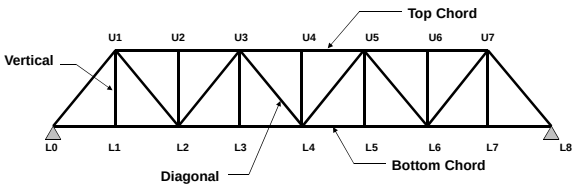
Truss Configurations

- The way truss members carry loads depends on the configuration of the truss.
- Most trusses are either Pratt or Warren trusses.

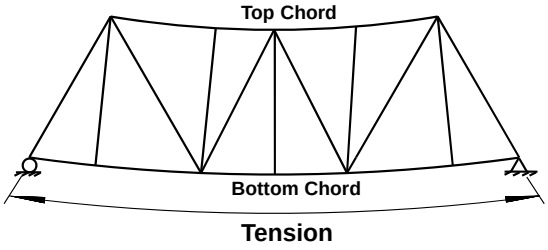
Pratt Truss



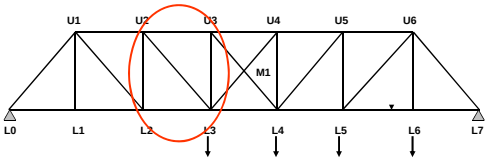
Warren Truss



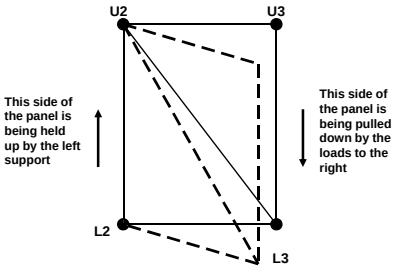
Truss Curvature



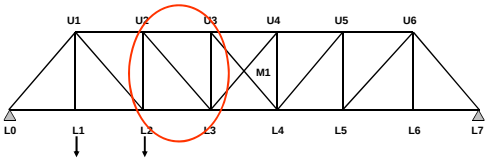
Loads in Diagonals



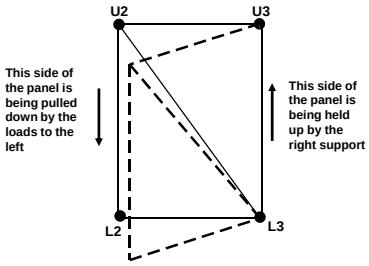
Loads in Diagonals



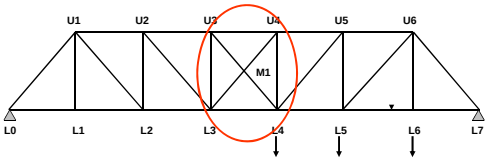
Loads in Diagonals



Loads in Diagonals



Loads in Diagonals



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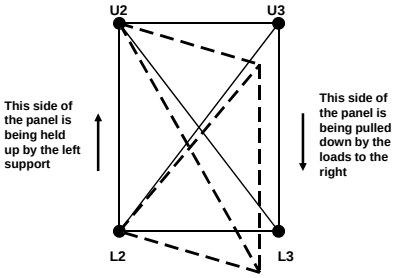

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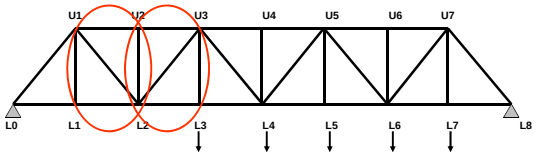
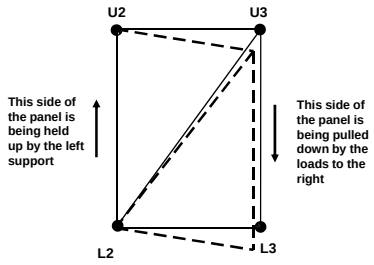
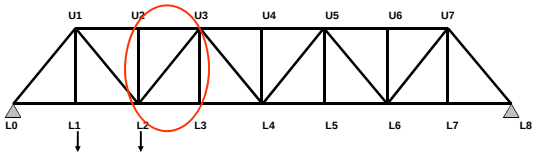


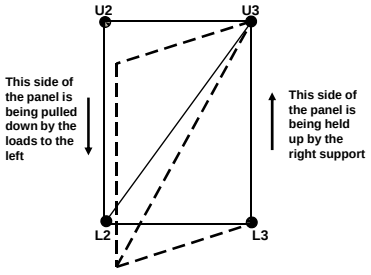
Loads in Diagonals



Loads in Diagonals



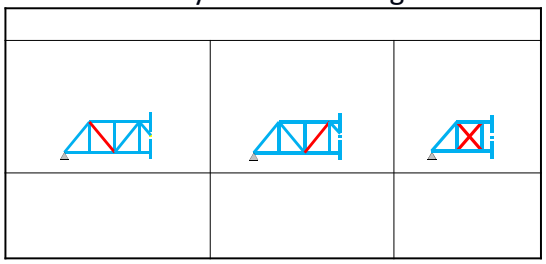
Loads in Diagonals



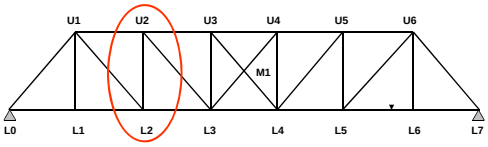
Summary – Loads in Diagonals

- Diagonals that slope away from the nearest support as they approach the bottom chord are primarily tension members.
- Some diagonals near the center of the truss may go into compression.
- Diagonals that slope towards the nearest support as they approach the bottom chord are primarily compression members.
- Crossed diagonals are tension members.

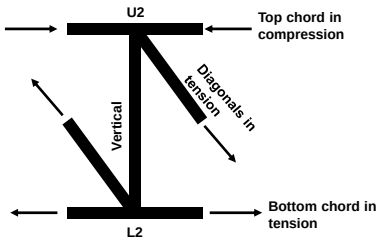
Summary – Loads in Diagonals



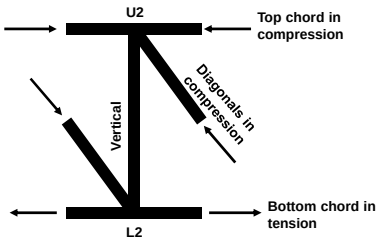
Loads in Verticals



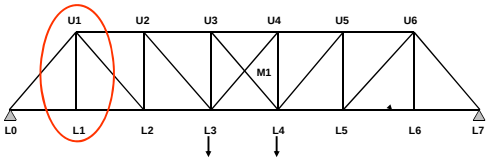
Loads in Verticals



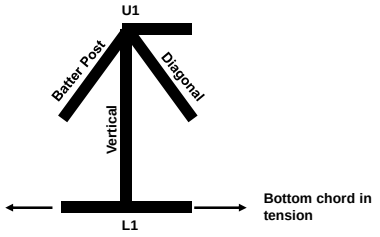
Loads in Verticals



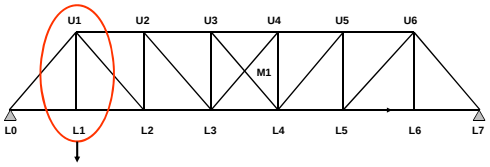
Loads in Verticals



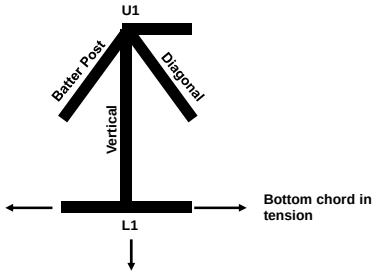
Loads in Verticals



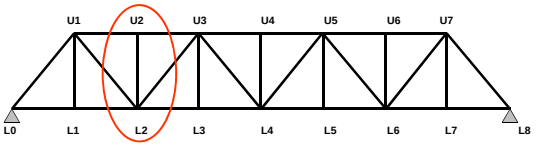
Loads in Verticals



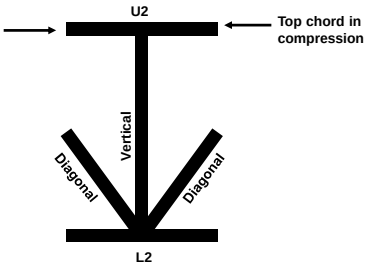
Loads in Verticals



Loads in Verticals



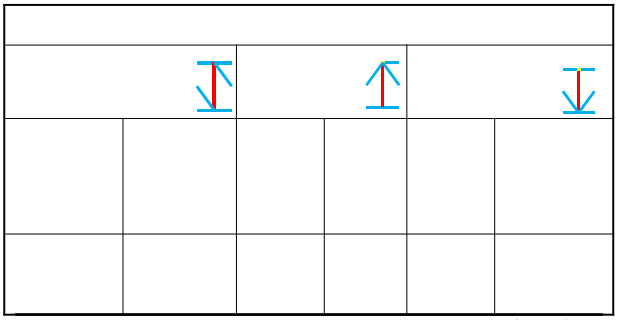
Loads in Verticals



Summary – Loads in Verticals

- Verticals connected to diagonals at both ends will be in compression if the diagonals are in tension and in tension if the diagonals are in compression.
- Verticals connected to diagonals at the top chord only will be in tension for pony and through trusses and will be unloaded for deck trusses.
- Verticals connected to diagonals at the bottom chord only will be in compression for deck trusses and will be unloaded for pony and through trusses.

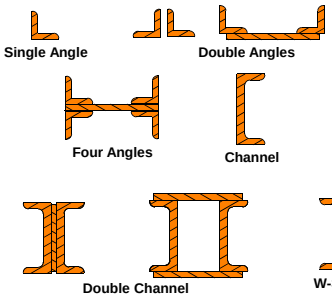
Summary – Loads in Verticals



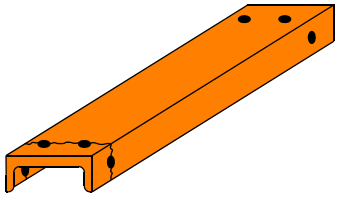
Summary – Loads in TC, BC & BP

- Top chords are in compression.
- Bottom chords are in tension.
- Batter posts are in compression.

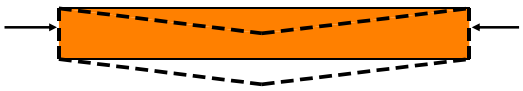
Steel Sections



Tension Member



Compression Member

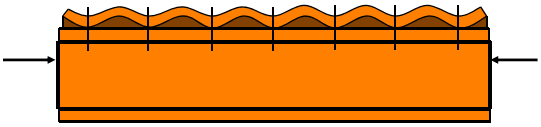


Misalignment of Member

Compression Member

Bent Member

Compression Member

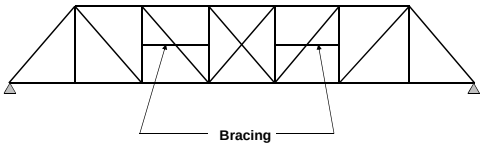


Rippling of Plate

Compression Member

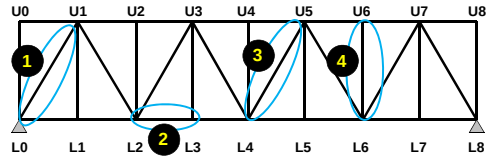
Rippling of Plate

Compression Member

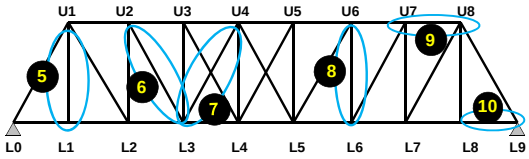


Bracing

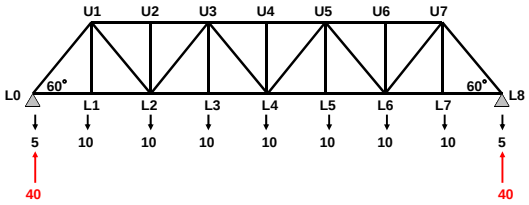
Class Exercise



Class Exercise



Truss Loads



Questions??