Design of Steel Flexural Members
Module #3

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AISC Beam Selection Tables allow us to easily select beams based on unbraced length and required moment capacity.

**HOW TO USE THEM:**

1. Enter into the chart with the maximum unbraced length “$L_b$”
2. Proceed upward to meet the horizontal gridline corresponding to the required moment capacity $M_u$.
3. Any beam listed above and to the right of the point so located will satisfy the bending capacity requirement.

**NOTE:** A dashed line indicates that a lighter more economical section is available for the given unbraced length and required moment.
Let’s assume we have beam with $L_b = 10$ ft and $M_u = 234$ k-ft

**Reduced Nominal Moment is:**

$\varnothing M_n = 237$ k-ft

**NOTE:** A dashed line indicates that a lighter more economical section is available for the given unbraced length and required moment.
A 30 foot long beam is pinned at midspan by a transverse bearing beam. The maximum factored moment in the beam (not including self weight) is 320 k-ft. Assume 50 ksi steel.

Select a beam from the AISC Unbraced Beam Tables
Designing to Meet Deflection Criteria

Design and building codes limit permissible deflection of structures. There are reasons for this:

- Comfort of occupants
- Damage to building components

Maximum deflections are:

- Roof structures: Total load deflection maximum = L/180
  Live load deflection maximum = L/240

- Floor structures: Total load deflection maximum = L/240
  Live load deflection maximum = L/360

- Structures with fragile components: = L/600

NOTE: DEFLECTION CALCULATIONS ARE PERFORMED USING UNFACTORED LOADS
Select the lightest wide flange beam with a depth not to exceed 14” to carry a design live load of 35 kips concentrated at the center of a 23.5 foot span. The live load deflection must be limited to L/360. Assume A36 steel and that the beam is continuously braced.