

I. Design Tables (AISC/LRFD Manual Part 4)

AISC provides sets of tables and charts which are useful in designing laterally supported beams.

The first set is found in Part 1 of the AISC manual **Dimensions and Properties**, which has been discussed previously.

The remaining four sets appear in Part 4 of the AISC Manual.

(1) Load Factor Design Selection Tables

- Tables 4-15 to 4-21
- These tables are used for shapes used as beams.
- The tables give the **moments** $\phi_b M_r$ and $\phi_b M_p$ for $F_y = 36$ and $F_y = 50$ ksi steels.
- The tables also list the **plastic modulus**, Z_x .
- What makes the tables useful is that the beams are arranged in **decreasing order** of Z_x .
- Furthermore, the beams are listed in groups and the top member of each group has the smallest weight and largest value of Z_x . Thus, the top member of each group is usually the best section for design. These sections are listed in bold face.
- The purpose of the tables is to find the lightest laterally supported beam which can handle the given moment load, M_u .

(2) Moment of Inertia Selection Tables

- Tables 4-24 to 4-27
- These tables are used for W and M shapes.
- These tables give the **moment of inertia** I_x and I_y .
- The beams are ordered in groups.
- The purpose of these tables is to find the lightest laterally supported beams which has a required moment of inertia I .
- These tables are useful for designing beams with excessive deflection.

(3) Beam Diagrams and Formulas

- Tables 4-189 to 4-206
- These pages of the AISC Manual give **reactions**, **deflections**, and **shears** for various loading and support conditions.
- These are extremely handy and concise guide for beam design.