

Steel Design HW 6 and 7 Summary

Plastic Section Modulus: units in^3 The plastic Section Modulus is the sum of the areas on each side of the neutral axis times the distance from the centroid of the section to the centroid of the areas on either side of the centroid.

$$Z_x = \frac{M_n}{F_y}$$
$$M_n = \frac{M_u}{0.9}$$

L_p : Limiting laterally unbraced length for full plastic flexural strength.

Total factored Load: $1.2D + 1.6L$

Max. Moment for Three Point Loads Equally Spaced:

$$M = \frac{PL}{2}$$

Required web A_w : $A_w = \frac{V}{0.9 F_y}$

Are the Moments and Shear forces of a distributed load and a point load additive?

Yes. The equation to find the max moment and shear force on a beam loaded with three point loads and a distributed load is as follows:

$$M_{max} = \frac{PL}{2} + \frac{wL^2}{8}$$
$$V_{max} = \frac{3P}{2} + \frac{wL}{8}$$