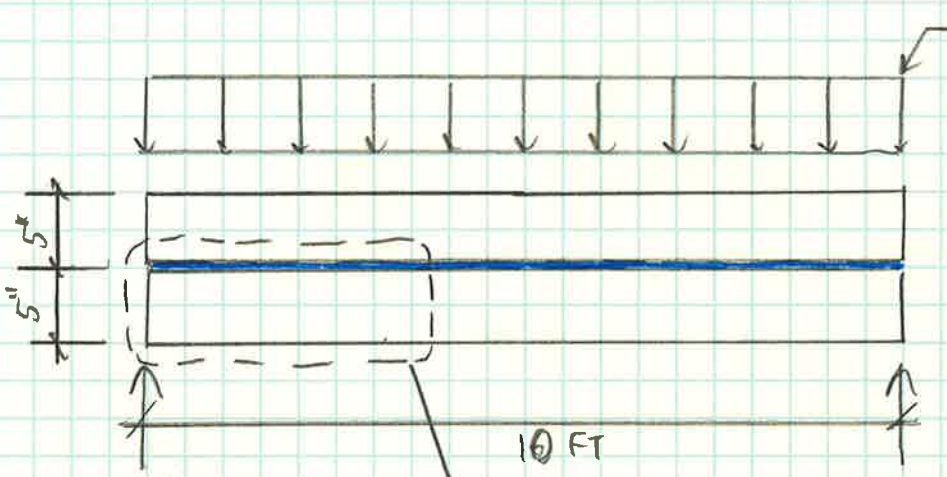
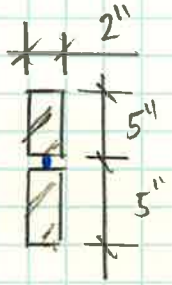
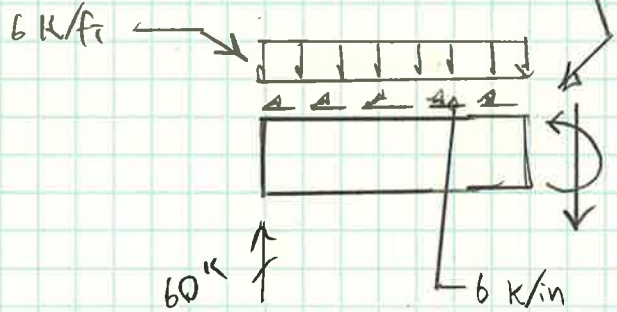
Halsall	PROJECT NO.	PAGE
	NAME	DATE





STEEL "STRIP" DESIGNED TO YIELD @ 6 KIP/IN



A BEAM STUDIED ON NEXT PAGE →

$L := 10ft$ Length of uniformly loaded, simply supported beam

$F_y := 36ksi$ Yield strength of steel

$b := 2in$ Width of rectangular beam section

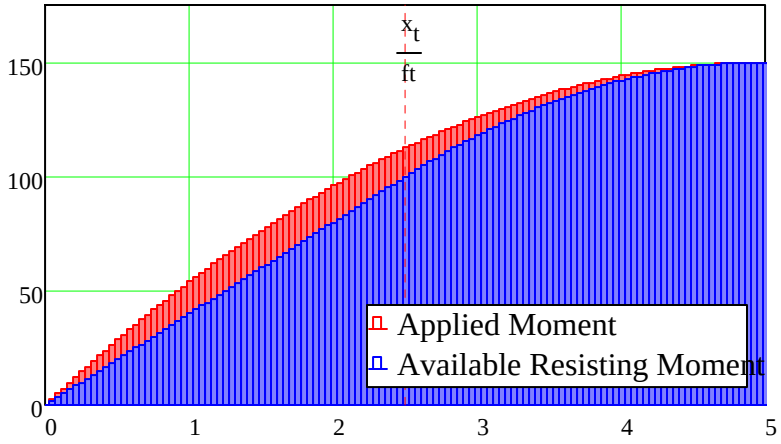
$d := 10in$ Depth of composite beam section

$d_{nc} := 5in$ Depth of non-composite (1/2) beam section

$Z_x = 50 \cdot in^3$ $M_p = 150 \cdot kip \cdot ft$ $M_e = 100 \cdot kip \cdot ft$ Composite section properties.

$Z_{x\_nc} = 12.5 \cdot in^3$ $M_{p\_nc} = 37.5 \cdot kip \cdot ft$ $M_{e\_nc} = 25 \cdot kip \cdot ft$ Non-composite section properties.

Applied & Available Resisting Moments (k x ft)



Position (ft)

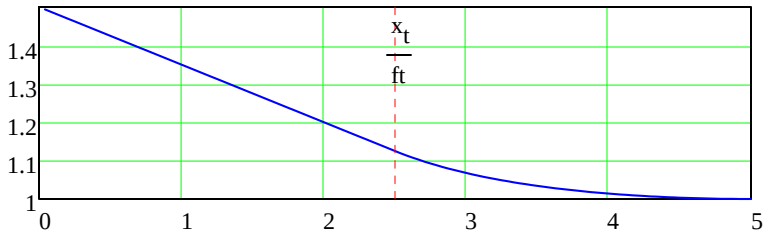
$w = 12 \cdot \frac{kip}{ft}$ Uniform load (develop plastic capacity at midspan).

$V_{max} = 60 \cdot kip$ End reaction.

$x_t = 2.5 \cdot ft$ Location where composite section begins to plastify

$q = 6 \cdot \frac{kip}{in}$ Unformly distributed horizontal shear capacity

Applied Moment / Available Resisting Moment

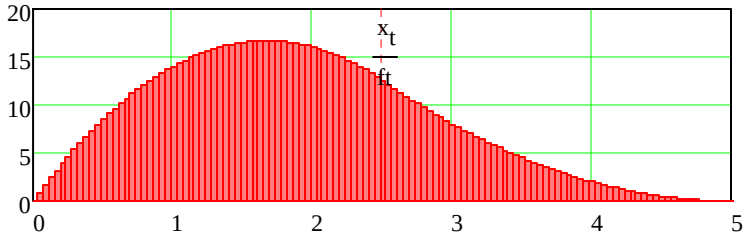


Position (ft)

$S_x := \frac{b \cdot (5in)^2}{6} = 8.333 \cdot in^3$

$\frac{15.625 kip \cdot ft}{S_x} \cdot b = 45 \cdot \frac{kip}{in}$

Remainder Moment (k x ft)



Position (ft)