

Calculation of yielding penetration zone of 8 WF 40

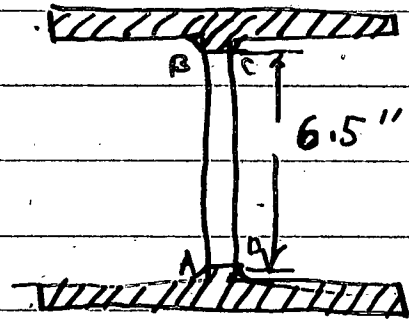
$$Z_o = 41.05 \text{ in}^3$$

$$t_w = 0.371 \text{''}$$

$$\sigma_{\text{flange}} = 37.6 \text{ kip/in}^2$$

$$\sigma_{\text{web}} = 38.7 \text{''}$$

$$M_{ABCO} = \left(\frac{6.5}{2}\right)^2 \times 371 = 3.91$$



$$M_o = (41.05 - 3.91) \times 37.6 + \frac{2}{3} \left(\frac{6.5}{2}\right)^2 \times 0.371 \times 38.7$$

$$M_o = 37.14 \times 37.6 + \frac{2}{3} (3.25)^2 \times 0.371 \times 38.7$$

$$= 1395 + 101 = 1495$$

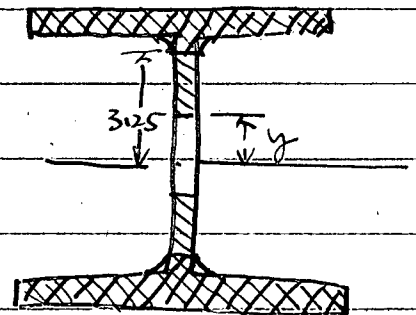
$$W = 21.6 \text{ (least load) kip}$$

$$l = 1495 / 21.6 = 69.3 \text{''}$$

$$M = 1395 + \frac{2}{3} y^2 \times 0.371 \times 38.7 + (3.25 - y)(3.25 + y) \times 38.7$$

$$= 1395 + \frac{2}{3} y^2 \times 0.371 \times 38.7$$

$$+ \frac{[(3.25)^2 - y^2]}{2} \times 371 \times 38.7$$



$$= 1395 + \frac{1}{8} 0.371 \times 38.7 + \frac{2}{3}$$

$$= 1395 - \frac{1}{3} 0.371 \times 38.7 y^2 + (3.25)^2 [0.371 \times 38.7]$$

$$= 1395 - \frac{1}{3} \times 14.35 y^2 + 3.25^2 \times 14.35 \neq$$

$$= 1395 + 151 - 4.78 y^2$$

$$= 1546 - 4.78 y^2 \quad \text{previous calculated 1540}$$

$$y = 0 \quad x = 1546 / 21.6 = 71.6''$$

$$y = 32.5'' \quad x = 69.3'' \quad 71.6 - 69.3 = 2.3''$$

The Curve

$$21.6 x = 1546 - 4.78 y^2 \quad \text{Between } x = 71.6'' \\ \& \quad x = 69.3''$$

Calculation of yield zone of #WF 31 to
be continued.

1. Simple tension test with white wash to see the yield lines develop as a comparison of measured strain.
2. more strain gages on cantilever to study slip mechanism in bending.

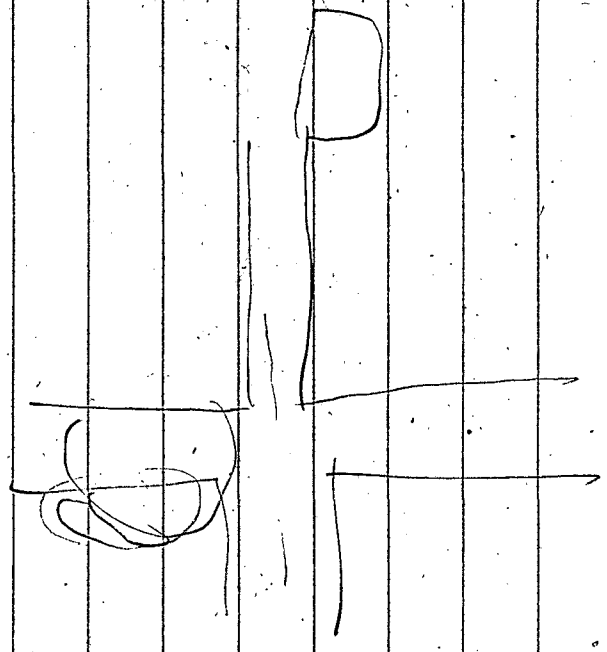
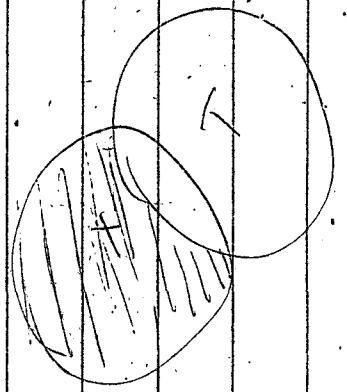
TAX

$$TAT = TAX$$

TAXATION

$$\begin{array}{r}
 6 \overline{) 185} \\
 \underline{12} \\
 65 \\
 \underline{63} \\
 2
 \end{array}$$

$$\begin{array}{r}
 TAX = 1.25 \\
 1.25 \overline{) 310} \\
 \underline{250} \\
 60 \\
 \underline{62.5} \\
 7.5
 \end{array}$$



$$\begin{array}{r}
 TAX = 60 \\
 \underline{65} \\
 5
 \end{array}$$