

STRESS IN REINFORCEMENT

BENDING MOMENT DIAGRAM FOR RECTANGULAR REINFORCED CONCRETE BEAMS

FORMULAE L. C. C. Notation

$$m = \frac{E_s}{E_c} = 15$$

$$n_1 = \sqrt{m^2 r^2 + 2mr} - mr$$

$$B \cdot bd^2 = tr \left(1 - \frac{n_1}{3}\right)$$

$$B \cdot bd^2 = \frac{c}{2} n_1 \left(1 - \frac{n_1}{3}\right)$$

ROUND BARS

Diameter		Area		Perimeter		Weight	
Inches	cm.	Inches	cm.	Inches	cm.	Lbs. per Ft.	Kgs. per M.
$\frac{1}{8}$	0.635	0.0491	0.3168	0.785	1.994	0.167	0.249
$\frac{3}{16}$	0.794	0.0767	0.4948	0.982	2.494	0.261	0.388
$\frac{1}{4}$	0.952	0.1104	0.7122	1.178	2.992	0.376	0.560
$\frac{5}{16}$	1.111	0.1503	0.9696	1.374	3.490	0.511	0.760
$\frac{3}{8}$	1.270	0.1963	1.2664	1.571	3.990	0.668	0.994
$\frac{7}{16}$	1.429	0.2485	1.6032	1.767	4.488	0.845	1.258
$\frac{1}{2}$	1.587	0.3068	1.9793	1.963	4.986	1.043	1.552
$\frac{9}{16}$	1.746	0.3712	2.3947	2.160	5.486	1.262	1.878
$\frac{5}{8}$	1.905	0.4418	2.8502	2.356	5.984	1.502	2.235
$\frac{11}{16}$	2.064	0.5185	3.3450	2.553	6.484	1.763	2.624
$\frac{3}{4}$	2.222	0.6013	3.8792	2.749	6.982	2.044	3.042
$\frac{13}{16}$	2.381	0.6903	4.4534	2.945	7.480	2.347	3.493
1	2.540	0.7854	5.0669	3.142	7.981	2.670	3.973
$1 \frac{1}{8}$	2.857	0.9940	6.4127	3.534	8.976	3.380	5.030
$1 \frac{1}{4}$	3.175	1.2272	7.9171	3.927	9.974	4.172	6.209

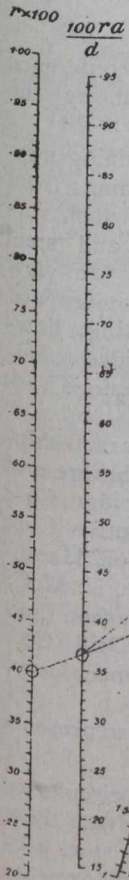
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STRESS IN CONCRETE

$$B \cdot bd^2$$

RATIO OF LEVER ARM TO DEPTH. $1 - \frac{n_1}{3}$

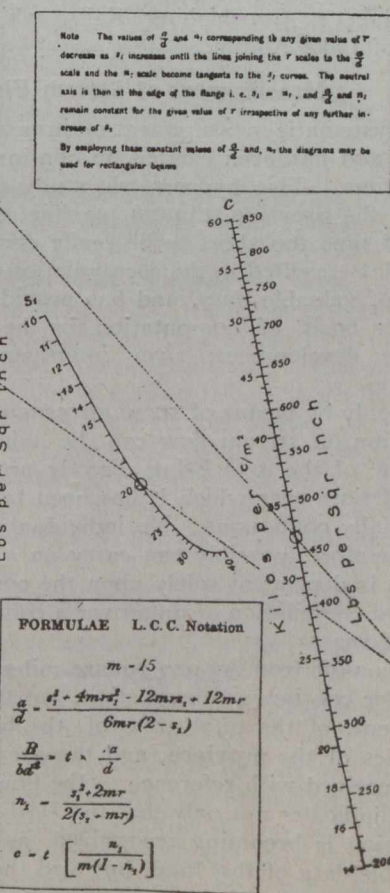
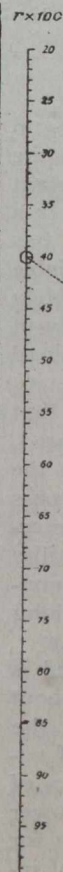
PERCENTAGE REINFORCEMENT. $r \times 100$



BENDING MOMENT DIAGRAM FOR REINFORCED CONCRETE TEE BEAMS

To be used as indicated by the dotted lines.

$r \times 100$



FORMULAE L. C. C. Notation

$$m = 15$$

$$\frac{a}{d} = \frac{t^2 + 4mr_1^2 - 12mr_1 + 12mr}{6mr(2 - r_1)}$$

$$\frac{B}{bd^2} = t \cdot \frac{a}{d}$$

$$n_1 = \frac{t^2 + 2mr}{2(t - mr)}$$

$$c = t \left[\frac{n_1}{m(1 - n_1)} \right]$$

Diagram of the Bending Moments of Reinforced Concrete Beams.

(For description see opposite page)