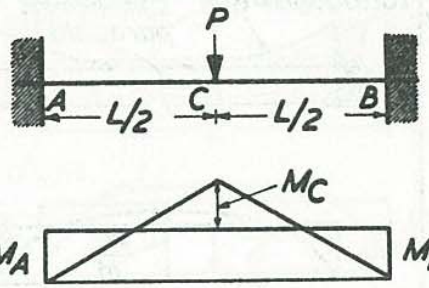
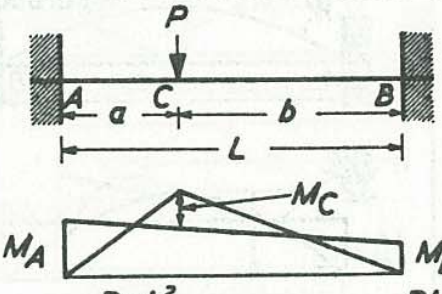
BUILT – IN BEAMS

LOADING





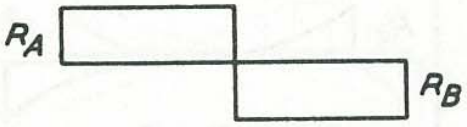
MOMENT

$-M_A = -M_B = M_C = PL/8$

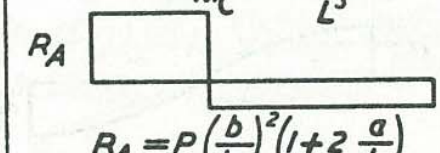
$M_A = -\frac{Pab^2}{L^2}$ $\quad M_B = -\frac{Pba^2}{L^2}$

$M_C = \frac{2Pa^2b^2}{L^3}$

SHEAR



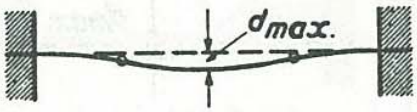
$R_A = R_B = P/2$



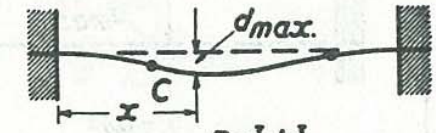
$R_A = P\left(\frac{b}{L}\right)^2\left(1+2\frac{a}{L}\right)$

$R_B = P\left(\frac{a}{L}\right)^2\left(1+2\frac{b}{L}\right)$

DEFLECTION



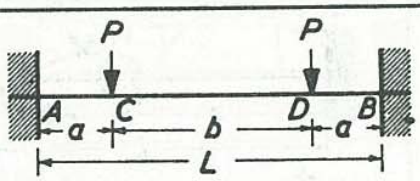
$d_{max.} = \frac{PL^3}{192\,EI}$

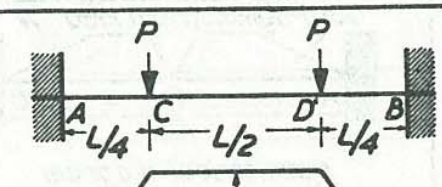


$d_C = \frac{Pa^3b^3}{3EIL^3}$

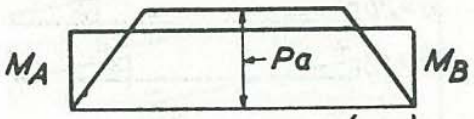
$d_{max.} = \frac{2Pa^2b^3}{3EI(3L-2a)^2}$ when $x = \frac{L^2}{3L-2a}$

LOADING



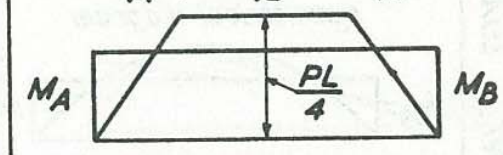


MOMENT



$M_A = M_B = -\frac{Pa(L-a)}{L}$

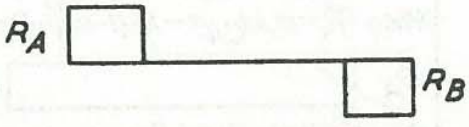
$M_C = M_D = Pa^2/L$



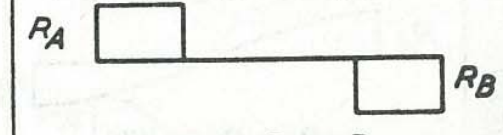
$M_A = M_B = -3PL/16$

$M_C = M_D = PL/16$

SHEAR

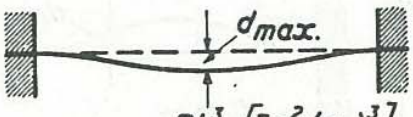


$R_A = R_B = P$

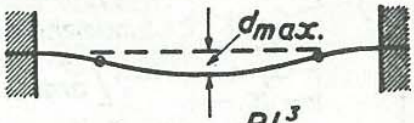


$R_A = R_B = P$

DEFLECTION



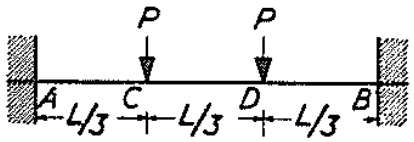
$d_{max.} = \frac{PL^3}{6EI}\left[\frac{3a^2}{4L^2} - \left(\frac{a}{L}\right)^3\right]$

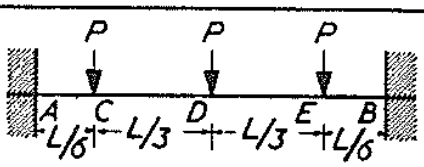


$d_{max.} = \frac{PL^3}{192\,EI}$

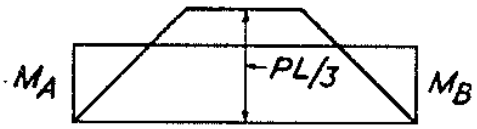
BUILT – IN BEAMS

LOADING



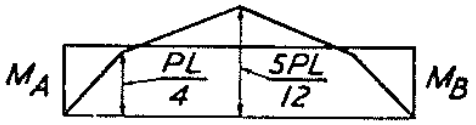


MOMENT



$M_A = M_B = -2PL/9$

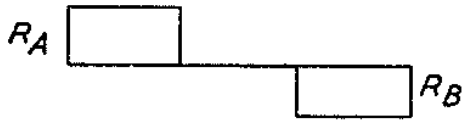
$M_C = M_D = PL/9$



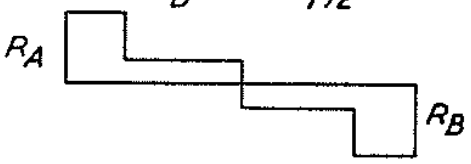
$M_A = M_B = -19PL/72$

$M_D = 11PL/72$

SHEAR

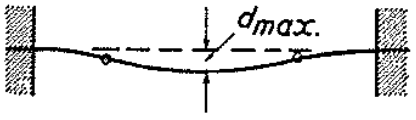


$R_A = R_B = P$

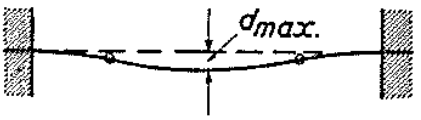


$R_A = R_B = 3P/2$

DEFLECTION

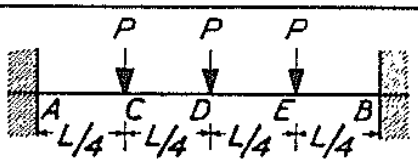


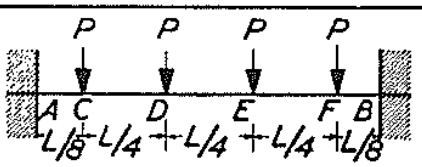
$d_{max.} = \frac{5PL^3}{648EI}$



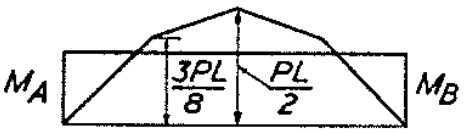
$d_{max.} = \frac{41PL^3}{5184EI}$

LOADING



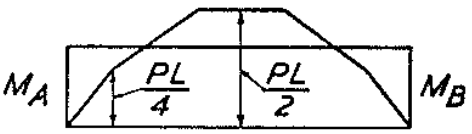


MOMENT



$M_A = M_B = -5PL/16$

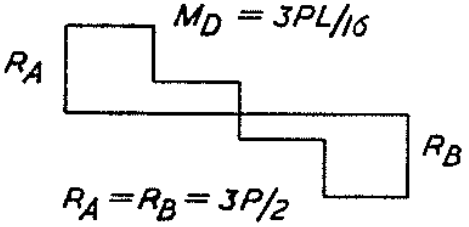
$M_D = 3PL/16$



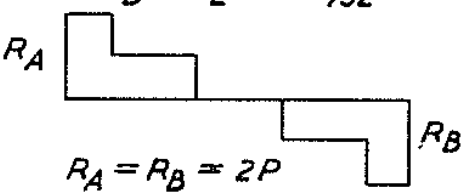
$M_A = M_B = -11PL/32$

$M_D = M_E = 5PL/32$

SHEAR

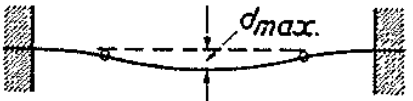


$R_A = R_B = 3P/2$

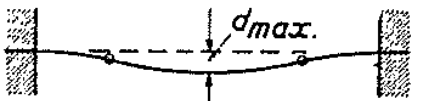


$R_A = R_B = 2P$

DEFLECTION

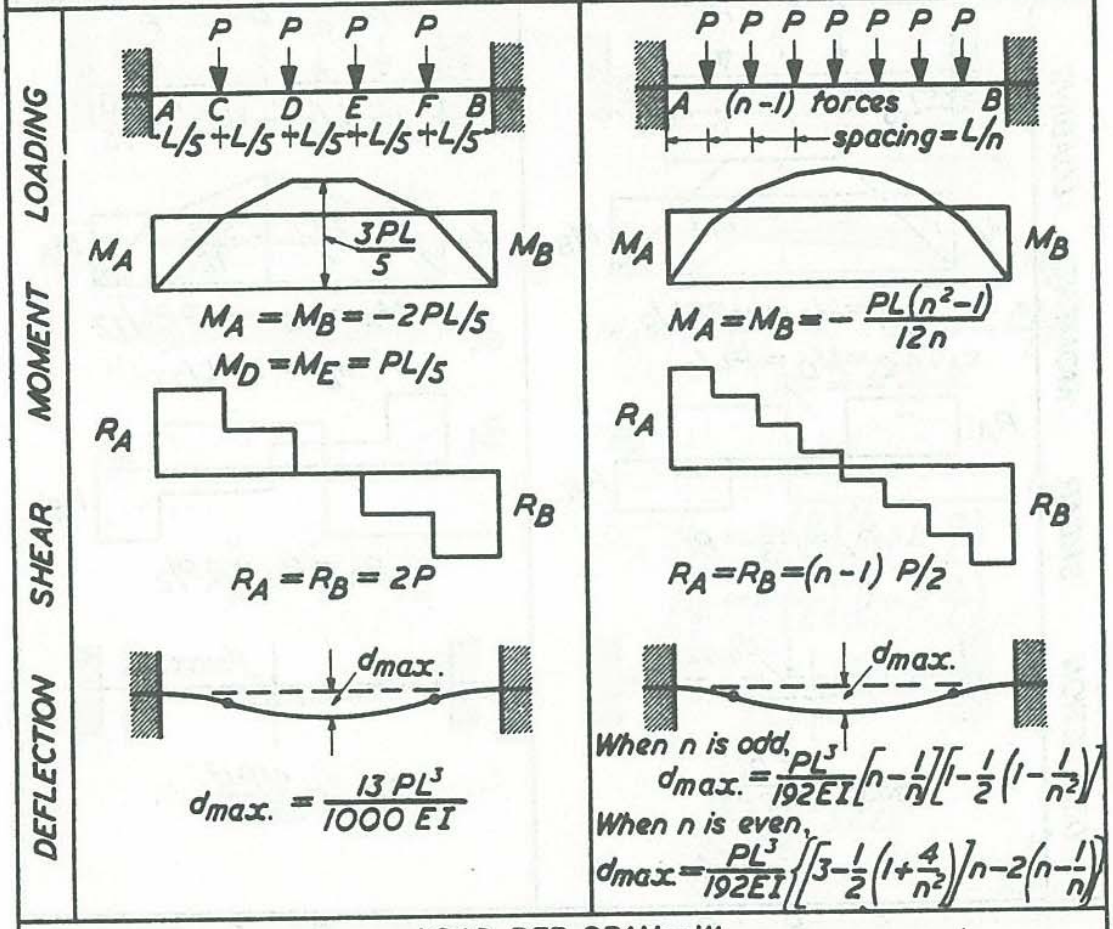


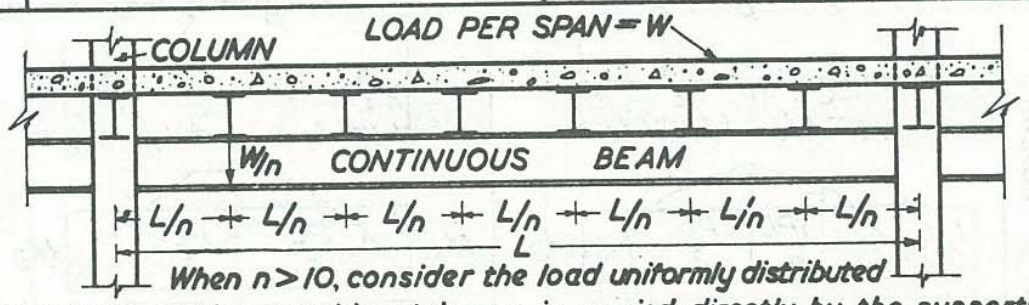
$d_{max.} = \frac{PL^3}{96EI}$



$d_{max.} = \frac{PL^3}{96EI}$

BUILT – IN BEAMS





The load on the outside stringers is carried directly by the supports

The continuous beam is assumed to be horizontal at each support

The reaction at the supports for each span = $W/2$, but the maximum shear force in any span of the continuous beam = $\frac{W(n-1)}{2n} = A.W$

The value of the fixing moment at each support = $-B.WL$

The value of the maximum positive moment for each span = $C.WL$

The value of the maximum deflection for each span = $0.0026 \frac{WL^3}{EI}$

Value of n	A	B	C
2	0·2500	0·0625	0·0625
3	0·3333	0·0741	0·0370
4	0·3750	0·0781	0·0469
5	0·4000	0·0800	0·0400
6	0·4167	0·0811	0·0439
7	0·4286	0·0816	0·0408
8	0·4375	0·0820	0·0430
9	0·4444	0·0823	0·0413
10	0·4500	0·0825	0·0425