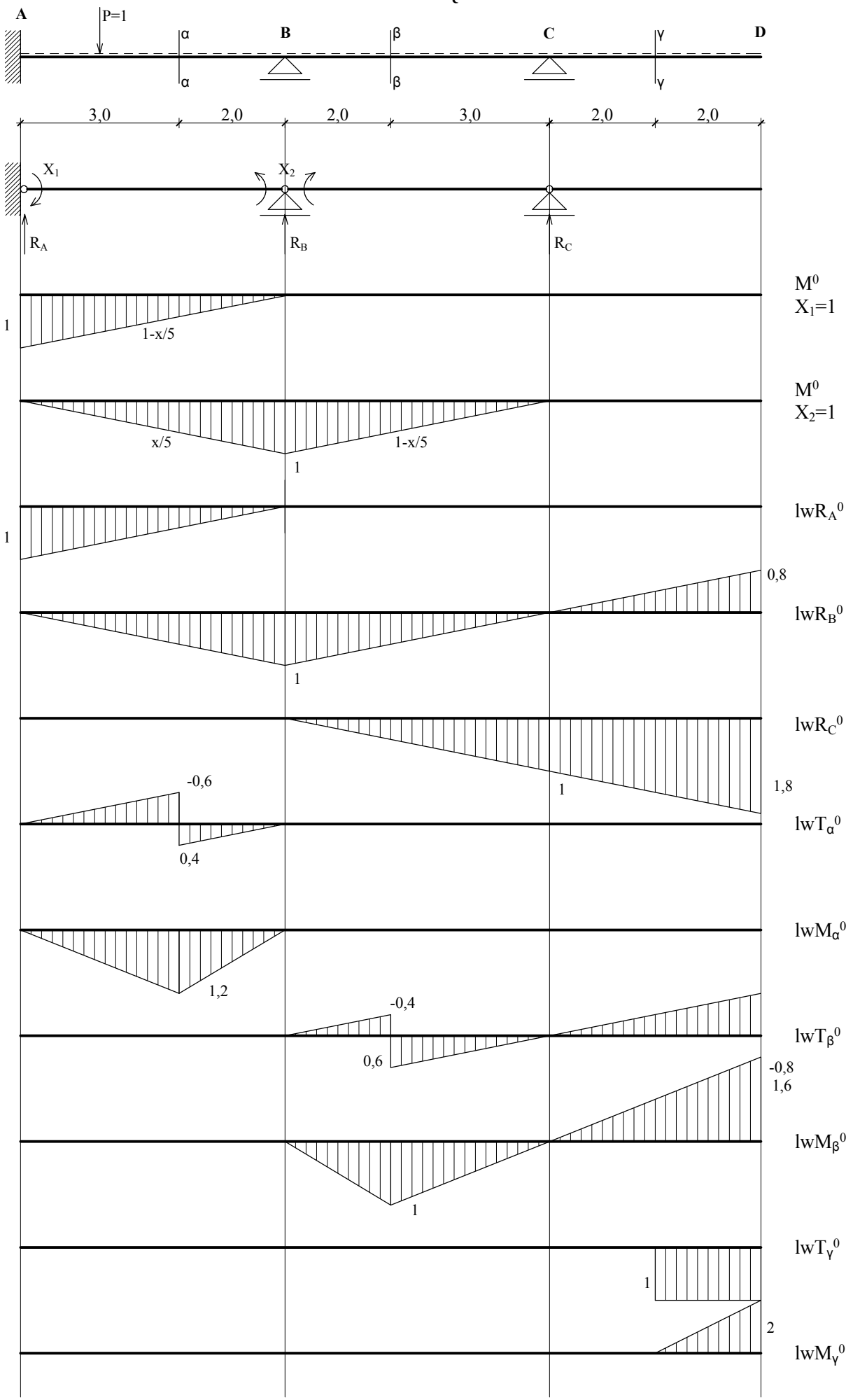
LINIE WPŁYWOWE
W BELKACH CIĄGŁYCH



$$\delta_{11} = \int \frac{M_1 M_1}{EI} ds = \frac{1}{EI}[\tfrac{1}{2} \cdot 5 \cdot 1 \cdot \tfrac{2}{3} \cdot 1] = \frac{5}{3} \cdot \frac{1}{EI}$$

$$\delta_{22} = \int \frac{M_2 M_2}{EI} ds = \frac{1}{EI}[\tfrac{1}{2} \cdot 5 \cdot 1 \cdot \tfrac{2}{3} \cdot 1] \cdot 2 = \frac{10}{3} \cdot \frac{1}{EI}$$

$$\delta_{12} = \int \frac{M_1 M_2}{EI} ds = \frac{1}{EI}[\tfrac{1}{2} \cdot 5 \cdot 1 \cdot \tfrac{1}{3} \cdot 1] = \frac{5}{6} \cdot \frac{1}{EI}$$

$P \in \langle A; B \rangle$

$$EI\delta''_{P1} = -1 + \frac{x}{5}$$

$$EI\delta'_{P1} = \frac{x^2}{10} - x + C$$

$$EI\delta_{P1} = \frac{x^3}{30} - \frac{x^2}{2} + Cx + D$$

$$\delta_{P1} = \frac{1}{EI}[\frac{x^3}{30} - \frac{x^2}{2} + \frac{5}{3}x]$$

$P \in \langle B; C \rangle$

$$EI\delta''_{P1} = 0$$

$$\delta_{P1} = 0$$

$P \in \langle C; D \rangle$

$$EI\delta''_{P1} = 0$$

$$\delta_{P1} = 0$$

$P \in \langle A; B \rangle$

$$EI\delta''_{P2} = -\frac{x}{5}$$

$$EI\delta'_{P2} = -\frac{x^2}{10} + C$$

$$EI\delta_{P2} = -\frac{x^3}{30} + Cx + D$$

$$\delta_{P2} = \frac{1}{EI}[-\frac{x^3}{30} + \frac{5}{3}x]$$

$P \in \langle B; C \rangle$

$$EI\delta''_{P2} = -1 + \frac{x}{5}$$

$$EI\delta'_{P2} = \frac{x^2}{10} - x + C$$

$$EI\delta_{P2} = \frac{x^3}{30} - \frac{x}{2} + Cx + D$$

$$\delta_{P2} = \frac{1}{EI}[\frac{x^3}{30} - \frac{x^2}{2} + \frac{5}{3}x]$$

$P \in \langle C; D \rangle$

$$EI\delta''_{P2} = 0$$

$$EI\delta'_{P2} = C$$

$$EI\delta_{P2} = Cx + D$$

$$\delta_{P2} = \frac{1}{EI}\frac{25}{6}x$$

$$\{X_k\} = [\beta_{ik}]\{\delta_{pi}\}$$

$$\beta_{ik} = -(-1)^{i+k}\frac{\Delta_{ik}}{\Delta}$$

$$X_1 = \beta_{11}\delta_{p1} + \beta_{12}\delta_{p2}$$
$$X_2 = \beta_{21}\delta_{p1} + \beta_{22}\delta_{p2}$$

$$\Delta = \delta_{11}\delta_{22} - \delta_{12}\delta_{21} = \frac{175}{36(EI)^2}$$

$$\beta_{11} = -(-1)^{1+1}\frac{10}{3EI}\cdot\frac{36(EI)^2}{175} = -\frac{24EI}{35}$$

$$\beta_{12} = -(-1)^{1+2}\frac{5}{6EI}\cdot\frac{36(EI)^2}{175} = \frac{6EI}{35}$$

$$\beta_{22} = -(-1)^{2+2}\frac{5}{3EI}\cdot\frac{36(EI)^2}{175} = -\frac{12EI}{35}$$

$P \in \langle A;B \rangle$

$$X_1 = -\frac{24}{35}\left[\frac{1}{30}x^3 - \frac{1}{2}x^2 - \frac{5}{3}x\right] + \frac{6}{35}\left[-\frac{1}{30}x^3 + \frac{5}{6}x\right] = -\frac{1}{35}x^3 + \frac{12}{35}x^2 - x$$

$$X_2 = -\frac{6}{35}\left[\frac{1}{30}x^3 - \frac{1}{2}x^2 - \frac{5}{3}x\right] - \frac{12}{35}\left[-\frac{1}{30}x^3 + \frac{5}{6}x\right] = \frac{3}{175}x^3 - \frac{15}{175}x^2$$

$P \in \langle B;C \rangle$

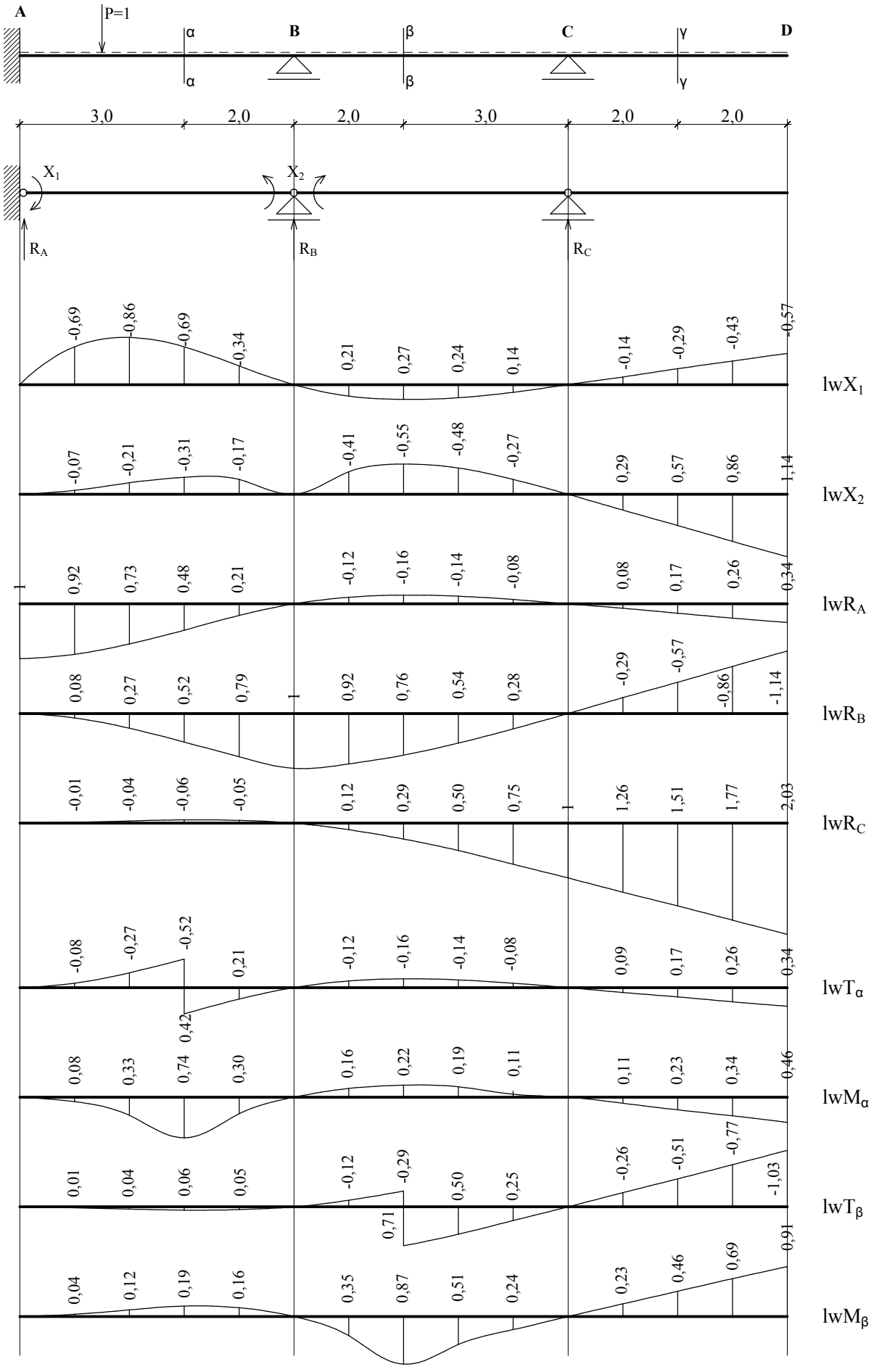
$$X_1 = -\frac{24}{35}\cdot 0 + \frac{6}{35}\left[\frac{1}{30}x^3 - \frac{1}{2}x^2 - \frac{5}{3}x\right] = \frac{1}{175}x^3 - \frac{15}{175}x^2 + \frac{50}{175}x$$

$$X_2 = -\frac{6}{35}\cdot 0 - \frac{12}{35}\left[\frac{1}{30}x^3 - \frac{1}{2}x^2 - \frac{5}{3}x\right] = \frac{2}{175}x^3 - \frac{30}{175}x^2 + \frac{100}{175}x$$

$P \in \langle C;D \rangle$

$$X_1 = -\frac{24}{35}\cdot 0 + \frac{6}{35}\cdot\frac{25}{6}x = \frac{5}{7}x$$

$$X_2 = -\frac{6}{35}\cdot 0 - \frac{12}{35}\cdot\frac{25}{6}x = -\frac{10}{7}x$$


A
P=1
α
B
β
C
γ
D
3,0
2,0
2,0
3,0
2,0
2,0
X1
X2
RA
RB
RC
-0,69 -0,86 -0,69 -0,34 0,21 0,27 0,24 0,14 -0,14 -0,29 -0,43 -0,57
lwX1
-0,07 -0,21 -0,31 -0,17 -0,41 -0,55 -0,48 -0,27 0,29 0,57 0,86 1,14
lwX2
1 0,92 0,73 0,48 0,21 -0,12 -0,16 -0,14 -0,08 0,08 0,17 0,26 0,34
lwRA
0,08 0,27 0,52 0,79 1 0,92 0,76 0,54 0,28 -0,29 -0,57 -0,86 -1,14
lwRB
-0,01 -0,04 -0,06 -0,05 0,12 0,29 0,50 0,75 1 1,26 1,51 1,77 2,03
lwRC
-0,08 -0,27 -0,52 0,42 0,21 -0,12 -0,16 -0,14 -0,08 0,09 0,17 0,26 0,34
lwTα
0,08 0,33 0,74 0,30 0,16 0,22 0,19 0,11 0,11 0,23 0,34 0,46
lwMα
0,01 0,04 0,06 0,05 -0,12 -0,29 0,50 0,25 -0,26 -0,51 -0,77 -1,03
lwTβ
0,71 0,91
0,04 0,12 0,19 0,16 0,35 0,87 0,51 0,24 0,23 0,46 0,69
lwMβ