From the rectangular load,

\[ x_2 = \frac{x}{2}, \quad P_2 = 100x. \]

\[ \sum F = 0: \quad 583.33 - 40x^2 - 100x - V(x) = 0 \]

or

\[ V(x) = 583.33 - 40x^2 - 100x \text{ N} \]

\[ \sum M_A = 0 = -\frac{2x}{3} (40x^2) - \frac{x}{2} (100x) - x(583.33 - 40x^2 - 100x) + M(x) = 0 \]

\[ M(x) = -\frac{40x^3}{3} - 50x^2 + 583.33x \text{ Nm} \]

See computer solutions for plots.