This model will be used to gain approximation of deflection of left end once load/moment are applied. Left end is not fixed on crane, but is simulated as such to gain a meaningful estimate.

Using G-1.3 & G-1.4 from textbook

\[ \delta_B = \frac{-P_l l_1^2}{6EI} (3L-l_1) + \frac{R_3 (l_2 + l_3)^2}{6EI} (3L-l_1-l_2) - \frac{P(l_1 + l_2)^2}{2EI} (3L-l_1-l_2-l_3) - \frac{T(l_1 + l_2 + l_3)}{2EI} (2L-l_1-l_2-l_3) \]

\[ \phi_B = \frac{-P_l l_1^2}{2EI} + \frac{R_3 (l_2 + l_3)^2}{2EI} - \frac{P(l_1 + l_2 + l_3)^2}{2EI} - \frac{T(l_1 + l_2 + l_3)}{EI} \]

\[ \delta = \frac{P l_2}{K} \]

\[ \phi_B = -5^\circ \]

Lift Geometry will utilize \( \delta_B \) and \( \phi_B \) to account for beam deflection.

Deflection