

$$\begin{bmatrix} R_{1x} \\ R_{1y} \\ F_{2x} \\ F_{2y} \\ R_{3x} \\ R_{3y} \\ R_{4x} \\ R_{4y} \end{bmatrix} = \begin{bmatrix} \frac{A_1 E_1}{L_1} & 0 & \dot{A} \frac{A_1 E_1}{L_1} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \dot{A} \frac{A_1 E_1}{L_1} & 0 & \frac{A_1 E_1}{L_1} + \frac{A_3 E_3}{5L_3} & \dot{A} \frac{2A_3 E_3}{5L_3} & 0 & \dot{A} \frac{A_3 E_3}{5L_3} & \frac{2A_3 E_3}{5L_3} \\ 0 & 0 & \dot{A} \frac{2A_3 E_3}{5L_3} & \frac{A_2 E_2}{L_2} + \frac{4A_3 E_3}{5L_3} & 0 & \dot{A} \frac{A_2 E_2}{L_2} & \frac{2A_3 E_3}{5L_3} & \dot{A} \frac{4A_3 E_3}{5L_3} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \dot{A} \frac{A_2 E_2}{L_2} & 0 & \frac{A_2 E_2}{L_2} & 0 & 0 \\ 0 & 0 & \dot{A} \frac{A_3 E_3}{5L_3} & \frac{2A_3 E_3}{5L_3} & 0 & \frac{A_3 E_3}{5L_3} & \dot{A} \frac{2A_3 E_3}{5L_3} & 0 \\ 0 & 0 & \frac{2A_3 E_3}{5L_3} & \dot{A} \frac{4A_3 E_3}{5L_3} & 0 & \dot{A} \frac{2A_3 E_3}{5L_3} & \frac{4A_3 E_3}{5L_3} & 0 \end{bmatrix} \begin{bmatrix} 0 \\ 0 \\ u_{2x} \\ u_{2y} \\ 0 \\ 0 \\ 0 \\ 0 \end{bmatrix} \quad (1)$$