$$
\mathrm{K}_{tot} =
\begin{bmatrix}
\frac{AEY}{L} & 0 & 0 & -\frac{AEY}{L} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & \frac{12EYIN}{L^3} & \frac{6EYIN}{L^2} & 0 & -\frac{12EYIN}{L^3} & \frac{6EYIN}{L^2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & \frac{6EYIN}{L^2} & \frac{4EYIN}{L} & 0 & -\frac{6EYIN}{L^2} & \frac{2EYIN}{L} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
-\frac{AEY}{L} & 0 & 0 & \frac{AEY}{L}+\frac{8AEY}{5\sqrt5 L}+\frac{12EYIN}{L^3}+\frac{96EYIN}{25\sqrt5 L^3} & \frac{192EYIN}{25\sqrt5 L^2}-\frac{4AEY}{5\sqrt5 L} & \frac{6EYIN}{L^2} & \frac{24EYIN}{L^2} & -\frac{12EYIN}{L^3} & 0 & 0 & \frac{6EYIN}{L^2} & 0 & 0 & -\frac{8AEY}{5\sqrt5 L}-\frac{96EYIN}{25\sqrt5 L^3} & \frac{4AEY}{5\sqrt5 L}-\frac{192EYIN}{25\sqrt5 L^3} & \frac{24EYIN}{5\sqrt5 L^2} \\[4pt]
0 & -\frac{12EYIN}{L^3} & -\frac{6EYIN}{L^2} & \frac{192EYIN}{25\sqrt5 L^2}-\frac{4AEY}{5\sqrt5 L} & \frac{AEY}{L}+\frac{2AEY}{5\sqrt5 L}+\frac{12EYIN}{L^3}+\frac{384EYIN}{25\sqrt5 L^3} & \frac{48EYIN}{5\sqrt5 L^2} & 0 & -\frac{6EYIN}{L^2} & -\frac{AEY}{L} & 0 & 0 & 0 & 0 & \frac{4AEY}{5\sqrt5 L}-\frac{192EYIN}{25\sqrt5 L^3} & -\frac{2AEY}{5\sqrt5 L}-\frac{384EYIN}{25\sqrt5 L^3} & \frac{48EYIN}{5\sqrt5 L^2} \\[4pt]
0 & \frac{6EYIN}{L^2} & \frac{2EYIN}{L} & \frac{6EYIN}{L^2} & \frac{48EYIN}{5\sqrt5 L^2} & \frac{8EYIN}{\sqrt5 L} & 0 & -\frac{6EYIN}{L^2} & 0 & 0 & 0 & 0 & 0 & -\frac{24EYIN}{5\sqrt5 L^2} & -\frac{48EYIN}{5\sqrt5 L^2} & \frac{4EYIN}{\sqrt5 L} \\[4pt]
0 & 0 & 0 & -\frac{12EYIN}{L^3} & -\frac{AEY}{L} & 0 & \frac{AEY}{L}+\frac{12EYIN}{L^3}+Km & 0 & 0 & -\frac{6EYIN}{L^2} & 0 & -\frac{AEY}{L} & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & -\frac{AEY}{L} & 0 & \frac{AEY}{L} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & \frac{12EYIN}{L^3} & 0 & \frac{12EYIN}{L^3} & \frac{6EYIN}{L^2} & 0 & -\frac{12EYIN}{L^3} & \frac{6EYIN}{L^2} & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & \frac{2EYIN}{L} & 0 & \frac{6EYIN}{L^2} & \frac{4EYIN}{L} & 0 & -\frac{6EYIN}{L^2} & \frac{2EYIN}{L} & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{AEY}{L} & 0 & \frac{AEY}{L}+\frac{96EYIN}{L^3} & 0 & -\frac{24EYIN}{L^3} & -\frac{96EYIN}{L^3} & 0 & -\frac{24EYIN}{L^2} \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{12EYIN}{L^3} & 0 & -\frac{6EYIN}{L^2} & \frac{2AEY}{L}+\frac{12EYIN}{L^3} & -\frac{6EYIN}{L^2} & 0 & -\frac{2AEY}{L} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & \frac{6EYIN}{L^2} & 0 & \frac{2EYIN}{L} & -\frac{24EYIN}{L^2} & 0 & \frac{12EYIN}{L^2} & \frac{24EYIN}{L^2} & \frac{24EYIN}{L^2} & \frac{24EYIN}{L^2} & \frac{4EYIN}{L} \\[4pt]
0 & 0 & 0 & -\frac{8AEY}{5\sqrt5 L}-\frac{96EYIN}{25\sqrt5 L^3} & \frac{4AEY}{5\sqrt5 L}-\frac{192EYIN}{25\sqrt5 L^3} & -\frac{24EYIN}{5\sqrt5 L^2} & 0 & 0 & 0 & 0 & -\frac{96EYIN}{L^3} & 0 & \frac{24EYIN}{L^2} & \frac{8AEY}{5\sqrt5 L}+\frac{96EYIN}{L^3}+\frac{96EYIN}{25\sqrt5 L^3} & \frac{192EYIN}{25\sqrt5 L^3}-\frac{4AEY}{5\sqrt5 L} & \frac{24EYIN}{L^2}-\frac{24EYIN}{5\sqrt5 L^2} \\[4pt]
0 & 0 & 0 & \frac{4AEY}{5\sqrt5 L}-\frac{192EYIN}{25\sqrt5 L^3} & -\frac{2AEY}{5\sqrt5 L}-\frac{384EYIN}{25\sqrt5 L^3} & -\frac{48EYIN}{5\sqrt5 L^2} & 0 & 0 & 0 & 0 & 0 & -\frac{2AEY}{L} & 0 & \frac{192EYIN}{25\sqrt5 L^3}-\frac{4AEY}{5\sqrt5 L} & \frac{2AEY}{L}+\frac{2AEY}{5\sqrt5 L}+\frac{384EYIN}{25\sqrt5 L^3} & \frac{8EYIN}{L}-\frac{24EYIN}{5\sqrt5 L^2} \\[4pt]
0 & 0 & 0 & \frac{24EYIN}{5\sqrt5 L^2} & \frac{48EYIN}{5\sqrt5 L^2} & \frac{4EYIN}{\sqrt5 L} & 0 & 0 & 0 & 0 & -\frac{24EYIN}{L^2} & 0 & \frac{4EYIN}{L} & \frac{24EYIN}{L^2}-\frac{24EYIN}{5\sqrt5 L^2} & \frac{8EYIN}{L}-\frac{24EYIN}{5\sqrt5 L^2} & \frac{8EYIN}{L}+\frac{8EYIN}{\sqrt5 L}
\end{bmatrix}
$$