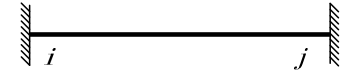
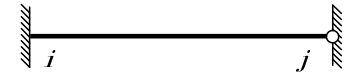


$$\begin{bmatrix} n_{i,j} \\ t_{i,j} \\ m_{i,j} \\ n_{j,i} \\ t_{j,i} \\ m_{j,i} \end{bmatrix} = \begin{bmatrix} \frac{EA}{\ell} & 0 & 0 & -\frac{EA}{\ell} & 0 & 0 \\ 0 & 12\frac{EI}{\ell^3} & -6\frac{EI}{\ell^2} & 0 & -12\frac{EI}{\ell^3} & -6\frac{EI}{\ell^2} \\ 0 & -6\frac{EI}{\ell^2} & 4\frac{EI}{\ell} & 0 & 6\frac{EI}{\ell^2} & 2\frac{EI}{\ell} \\ -\frac{EA}{\ell} & 0 & 0 & \frac{EA}{\ell} & 0 & 0 \\ 0 & -12\frac{EI}{\ell^3} & 6\frac{EI}{\ell^2} & 0 & 12\frac{EI}{\ell^3} & 6\frac{EI}{\ell^2} \\ 0 & -6\frac{EI}{\ell^2} & 2\frac{EI}{\ell} & 0 & 6\frac{EI}{\ell^2} & 4\frac{EI}{\ell} \end{bmatrix} \begin{bmatrix} u_{i,j} \\ v_{i,j} \\ \phi_{i,j} \\ u_{j,i} \\ v_{j,i} \\ \phi_{j,i} \end{bmatrix}$$



$$\begin{bmatrix} n_{i,j} \\ t_{i,j} \\ m_{i,j} \\ n_{j,i} \\ t_{j,i} \\ m_{j,i} \end{bmatrix} = \begin{bmatrix} \frac{EA}{\ell} & 0 & 0 & -\frac{EA}{\ell} & 0 & 0 \\ 0 & 3\frac{EI}{\ell^3} & 3\frac{EI}{\ell^2} & 0 & -3\frac{EI}{\ell^3} & 0 \\ 0 & 3\frac{EI}{\ell^2} & 3\frac{EI}{\ell} & 0 & -3\frac{EI}{\ell^2} & 0 \\ -\frac{EA}{\ell} & 0 & 0 & \frac{EA}{\ell} & 0 & 0 \\ 0 & -3\frac{EI}{\ell^3} & -3\frac{EI}{\ell^2} & 0 & 3\frac{EI}{\ell^3} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} u_{i,j} \\ v_{i,j} \\ \phi_{i,j} \\ u_{j,i} \\ v_{j,i} \\ \phi_{j,i} \end{bmatrix}$$



$$\begin{bmatrix} n_{i,j} \\ t_{i,j} \\ m_{i,j} \\ n_{j,i} \\ t_{j,i} \\ m_{j,i} \end{bmatrix} = \begin{bmatrix} \frac{EA}{\ell} & 0 & 0 & -\frac{EA}{\ell} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{EI}{\ell} & 0 & 0 & -\frac{EI}{\ell} \\ -\frac{EA}{\ell} & 0 & 0 & \frac{EA}{\ell} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{EI}{\ell} & 0 & 0 & \frac{EI}{\ell} \end{bmatrix} \begin{bmatrix} u_{i,j} \\ v_{i,j} \\ \phi_{i,j} \\ u_{j,i} \\ v_{j,i} \\ \phi_{j,i} \end{bmatrix}$$

