

Diagram illustrating the assembly of a global stiffness matrix \mathbf{S} from three element matrices \mathbf{K}_1 , \mathbf{K}_2 , and \mathbf{K}_3 .

Matrix \mathbf{K}_1 (4x4):

| | | | |
|----------------|----------------|----------------|----------------|
| 3 | 4 | 1 | 2 |
| $K_{11}^{(1)}$ | $K_{12}^{(1)}$ | $K_{13}^{(1)}$ | $K_{14}^{(1)}$ |
| $K_{21}^{(1)}$ | $K_{22}^{(1)}$ | $K_{23}^{(1)}$ | $K_{24}^{(1)}$ |
| $K_{31}^{(1)}$ | $K_{32}^{(1)}$ | $K_{33}^{(1)}$ | $K_{34}^{(1)}$ |
| $K_{41}^{(1)}$ | $K_{42}^{(1)}$ | $K_{43}^{(1)}$ | $K_{44}^{(1)}$ |
| 3 | 4 | 1 | 2 |

Matrix \mathbf{K}_2 (4x4):

| | | | |
|----------------|----------------|----------------|----------------|
| 1 | 2 | 5 | 6 |
| $K_{11}^{(2)}$ | $K_{12}^{(2)}$ | $K_{13}^{(2)}$ | $K_{14}^{(2)}$ |
| $K_{21}^{(2)}$ | $K_{22}^{(2)}$ | $K_{23}^{(2)}$ | $K_{24}^{(2)}$ |
| $K_{31}^{(2)}$ | $K_{32}^{(2)}$ | $K_{33}^{(2)}$ | $K_{34}^{(2)}$ |
| $K_{41}^{(2)}$ | $K_{42}^{(2)}$ | $K_{43}^{(2)}$ | $K_{44}^{(2)}$ |
| 1 | 2 | 5 | 6 |

Matrix \mathbf{K}_3 (8x8):

| | | | |
|----------------|----------------|----------------|----------------|
| 7 | 8 | 1 | 2 |
| $K_{11}^{(3)}$ | $K_{12}^{(3)}$ | $K_{13}^{(3)}$ | $K_{14}^{(3)}$ |
| $K_{21}^{(3)}$ | $K_{22}^{(3)}$ | $K_{23}^{(3)}$ | $K_{24}^{(3)}$ |
| $K_{31}^{(3)}$ | $K_{32}^{(3)}$ | $K_{33}^{(3)}$ | $K_{34}^{(3)}$ |
| $K_{41}^{(3)}$ | $K_{42}^{(3)}$ | $K_{43}^{(3)}$ | $K_{44}^{(3)}$ |
| 7 | 8 | 1 | 2 |

Global Matrix \mathbf{S} (2x2):

| | |
|--|--|
| 1 | 2 |
| $K_{33}^{(1)} + K_{11}^{(2)} + K_{33}^{(3)}$ | $K_{34}^{(1)} + K_{12}^{(2)} + K_{34}^{(3)}$ |
| $K_{43}^{(1)} + K_{21}^{(2)} + K_{43}^{(3)}$ | $K_{44}^{(1)} + K_{22}^{(2)} + K_{44}^{(3)}$ |
| 1 | 2 |

Dashed arrows indicate the mapping from the element matrices \mathbf{K}_1 , \mathbf{K}_2 , and \mathbf{K}_3 to the corresponding blocks in the global matrix \mathbf{S} .