$$i \qquad i+1 \qquad i+2 \qquad \delta \phi_{ij} = -\sum_{k=i}^{j-1} \Delta \tilde{\mathbf{R}}_{k+1j}^{\mathsf{T}} \mathbf{J}_{r}^{k} \boldsymbol{\eta}_{k}^{gd} \Delta t \qquad j-1 \qquad j+1 \\ \delta \phi_{ij+1} = -\sum_{k=i}^{j} \Delta \tilde{\mathbf{R}}_{k+1j+1}^{\mathsf{T}} \mathbf{J}_{r}^{k} \boldsymbol{\eta}_{k}^{gd} \Delta t \qquad j-1 \qquad j+1 \\ \Delta \tilde{\mathbf{R}}_{i+1j} \Delta \tilde{\mathbf{R}}_{i+1j+1} \qquad \Delta \tilde{\mathbf{R}}_{i+2j+1} \qquad \Delta \tilde{\mathbf{R}}_{j-1j} \Delta \tilde{\mathbf{R}}_{j-1j+1}$$