$$R_{\varepsilon_i^c} = \int\limits_{r_{i-1}}^{r_i} \Big[\frac{\partial N_i}{\partial r} \quad \frac{N_i}{r}\Big]\big[D\big]\{\varepsilon_i^c\}dr + \int\limits_{r_i}^{r_{i+1}} \Big[\frac{\partial N_{i+1}}{\partial r} \quad \frac{N_{i+1}}{r}\Big]\big[D\big]\{\varepsilon_{i+1}^c\}dr, \tag{1}$$

$$[D] = \begin{bmatrix} \lambda + 2\mu & \lambda \\ \lambda & \lambda + 2\mu \end{bmatrix}$$

$$[\varepsilon_i^c\} = \begin{pmatrix} \varepsilon_{rr,i}^c \\ \varepsilon_{\varphi\varphi,i}^c \end{pmatrix}$$

$$\begin{aligned} R_{\varepsilon_i^c} = &\int\limits_{r_{i-1}}^{r_i} \varepsilon_{rr,i}^c\Big(\big(\lambda + 2\mu\big)\frac{\partial N_i}{\partial r}r + \lambda N_i\Big) + \varepsilon_{\varphi\varphi,i}^c\Big(\lambda\frac{\partial N_i}{\partial r}r + \big(\lambda + 2\mu\big)N_i\Big)dr + \\ &+ \int\limits_{r_i}^{r_{i+1}} \varepsilon_{rr,i+1}^c\Big(\big(\lambda + 2\mu\big)\frac{\partial N_{i+1}}{\partial r}r + \lambda N_{i+1}\Big) + \varepsilon_{\varphi\varphi,i+1}^c\Big(\lambda\frac{\partial N_{i+1}}{\partial r}r + \big(\lambda + 2\mu\big)N_{i+1}\Big)dr. \end{aligned} \tag{2}$$