The total amortized cost of n operations is

$$\sum_{k=1}^{n} c'_k = \sum_{k=1}^{n} (c_k + \Phi(D_k) - \Phi(D_{k-1}))$$

$$= \Phi(D_n) - \Phi(D_0) + \sum_{k=1}^{n} c_k$$

$$\geq \sum_{k=1}^{n} c_k$$