$$ {}^{l}\delta_{ip} = \frac{\partial E_p}{\partial\ {}^{l}x_{ip}} = \left[\frac{\partial\ {}^{l+1}\boldsymbol{x}_p}{\partial\ {}^{l}x_{ip}}\right]^{\mathrm{T}} \cdot \frac{\partial E_p}{\partial\ {}^{l+1}\boldsymbol{x}_p} $$

$$ \frac{\partial E_p}{\partial\ {}^{l+1}x_{kp}} = {}^{l+1}\delta_{kp} $$

$$ \frac{\partial\ {}^{l+1}x_{kp}}{\partial\ {}^{l}x_{ip}} = \frac{\partial \sum_i {}^{l+1}w_{ik}\ {}^{l}O_{ip}}{\partial \sum_j {}^{l}x_{ip}} = {}^{l+1}w_{ik} \cdot f'({}^{l}x_{ip}) $$