$$A_k = \left(\begin{array}{ccc|ccc} 1 & & & 0 & & \\ & \ddots & & & \ddots & \\ & & 1 & & & 0 \end{array}\right)\left.\right\} N+1$$

$$\underbrace{\hphantom{\begin{array}{ccc}1&&\\&\ddots&\\&&1\end{array}}}_{N+1}\underbrace{\hphantom{\begin{array}{ccc}0&&\\&\ddots&\\&&0\end{array}}}_{2N+1}$$

$$\left(\begin{array}{ccc|ccc} d_1 & & & & & \\ & \ddots & & & & \\ & & d_r & & & \\ \hline & & & 0 & & \\ & & & & \ddots & \\ & & & & & 0 \end{array}\right) \qquad (1)$$

$$\underbrace{\hphantom{\begin{array}{ccc}0&&\\&\ddots&\\&&0\end{array}}}_{n-r} \qquad (2)$$

1