$$U = \begin{pmatrix} z_{D_{FIR}} & \cdots & z_1 & z_0 & 0 & \cdots & 0 \\ z_{D_{FIR}+1} & \cdots & z_2 & z_1 & z_0 & \cdots & 0 \\ \vdots & & & \ddots & & & \vdots \\ z_{D_{FIR}+n} & \cdots & z_{n+1} & z_n & z_{n-1} & \cdots & z_{n-D_{FIR}} \\ \vdots & & & \ddots & & & \vdots \\ z_{3D_{FIR}+n} & \cdots & z_{n+2D_{FIR}+1} & z_{n+2D_{FIR}} & z_{n+2D_{FIR}-1} & \cdots & z_{n+D_{FIR}} \\ \vdots & & & \ddots & & & \vdots \\ 0 & \cdots & z_{N-1} & z_{N-2} & z_{N-3} & \cdots & z_{N-2-D_{FIR}} \\ 0 & \cdots & 0 & z_{N-1} & z_{N-2} & \cdots & z_{N-1-D_{FIR}} \end{pmatrix} \quad Q_n$$