The Winograd transformation matrices for block sizes 4x4 and 8x8 are typically defined with specific coefficients to ensure efficient computation of the Fourier transform. Here's how you might define these matrices:

1. **G Matrix (for input transformation):**
For a 4x4 block size, the G matrix might look like this:

$$G_{4x4} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ \frac{1}{2} & \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & -\frac{1}{2} & \frac{1}{2} & -\frac{1}{2} \\ 0 & 0 & 1 & -1 \end{bmatrix}$$

For an 8x8 block size, the G matrix might look like this:

$$G_{8x8} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{1}{2} & \frac{1}{2} & \frac{1}{2} & \frac{1}{2} & \frac{1}{2} & \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & -\frac{1}{2} & \frac{1}{2} & -\frac{1}{2} & \frac{1}{2} & -\frac{1}{2} & \frac{1}{2} & -\frac{1}{2} \\ \frac{1}{4} & \frac{1}{8} & \frac{1}{4} & \frac{1}{8} & \frac{1}{4} & \frac{1}{8} & \frac{1}{4} & \frac{1}{8} \\ \frac{1}{4} & -\frac{1}{8} & \frac{1}{4} & -\frac{1}{8} & \frac{1}{4} & -\frac{1}{8} & \frac{1}{4} & -\frac{1}{8} \\ \frac{1}{8} & \frac{1}{4} & \frac{1}{8} & \frac{1}{4} & \frac{1}{8} & \frac{1}{4} & \frac{1}{8} & \frac{1}{4} \\ \frac{1}{8} & -\frac{1}{4} & \frac{1}{8} & -\frac{1}{4} & \frac{1}{8} & -\frac{1}{4} & \frac{1}{8} & -\frac{1}{4} \\ 0 & 0 & 1 & 0 & 0 & 0 & -1 & 0 \end{bmatrix}$$

2. **B Matrix (for computation):**
For both block sizes, the B matrix remains the same and might look like this:

$$B = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 1 & 1 & 1 & 1 \\ 1 & -1 & 1 & -1 \\ 0 & 0 & 1 & -1 \end{bmatrix}$$

These matrices are designed to minimize the number of arithmetic operations required for the computation of the Fourier transform, thereby improving computational efficiency.