m = IdentityMatrix [Length [StencilPoints]]

$$\begin{split} \mathbf{m} &= \{\{1,\,0,\,0,\,0,\,0,\,0\},\,\{0,\,1,\,1,\,0,\,0,\,0\}\,\mathbf{s},\,\{0,\,-1,\,1,\,0,\,0,\,0\}\,\mathbf{s},\\ \{0,\,0,\,0,\,-1,\,1,\,0\}\,\mathbf{s},\,\{0,\,0,\,0,\,1,\,1,\,0\}\,\mathbf{s},\,\{0,\,0,\,0,\,0,\,0,\,1\}\} \end{split}$$

$$\left\{\{\text{1,0,0,0,0,0},\,\{\text{0,}\,\frac{1}{\sqrt{2}}\,,\,\frac{1}{\sqrt{2}}\,,\,\text{0,0,0}\right\},\,\left\{\text{0,-}\frac{1}{\sqrt{2}}\,,\,\frac{1}{\sqrt{2}}\,,\,\text{0,0,0}\right\},$$

$$\left\{0, 0, 0, -\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, 0\right\}, \left\{0, 0, 0, \frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, 0\right\}, \left\{0, 0, 0, 0, 0, 1\right\}\right\}$$

## Transpose[m].u

{3847.2, 2889.52, 2530.88, 725.774, 360.342, 768.}