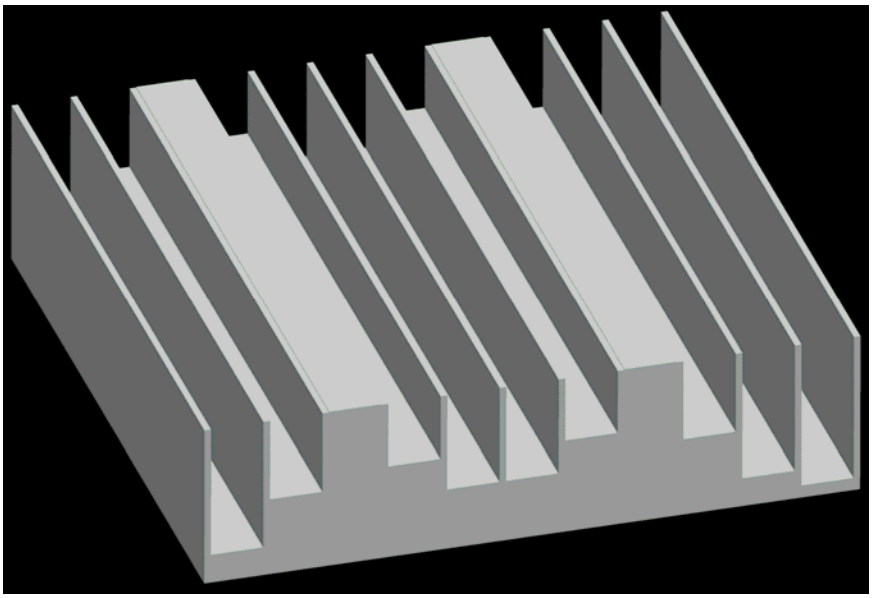
The maximum depth of the wells determines the effective low frequency limit of the diffusers. The well depth should be 1½ times the wavelength at the lowest frequency. The highest frequency scattered is determined by the well width, which is half a wavelength at the highest frequency. The actual sequence of wells used is determined by number theory.

A 3-D view of a 1-D Quadratic Residue sound diffuser is shown in the figure below:



A 1-Dimensional Quadratic Residue Phase-Grating Sound Diffuser (QRD)

Schroeder-type QRD sound diffusers have been installed *e.g.* in Carnegie Hall in NYC to improve the acoustics there by eliminating echoes from the back wall of this concert hall, as shown in the figure below: