

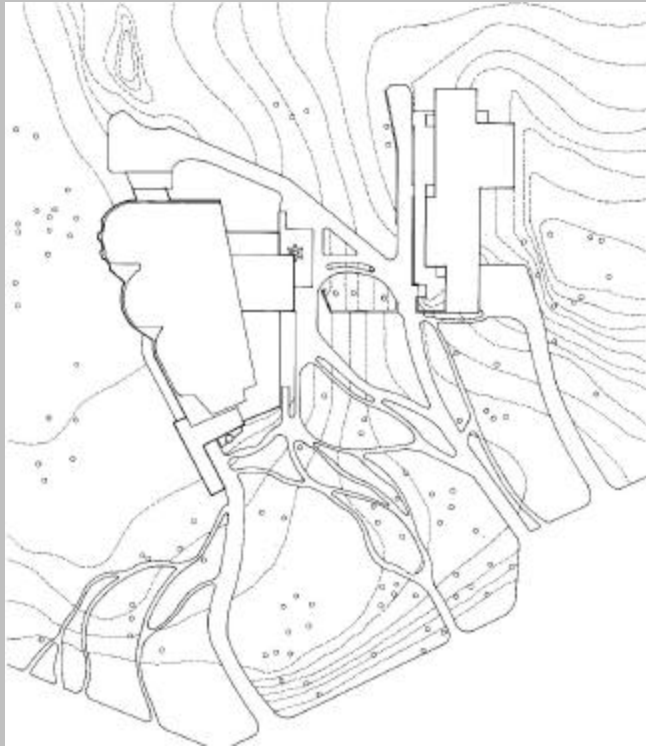


The church of three crosses

Vuoksenniska church

Alvar Aalto

1956-58



“...symphonic orchestration of light to create a series of different moods in both space and time.”

The church consists of three volumes that can be open into one large space for 800 people or divided into three smaller halls.

The free form of nature expressed in the undulating walls meets the straight, front wall that addresses the street side.

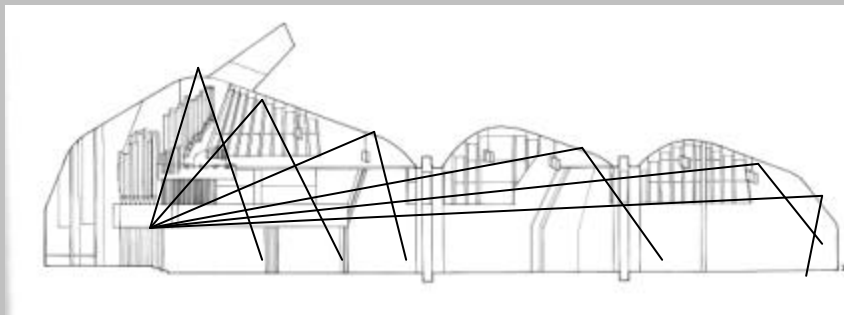
The vaulted ceiling was calculated to distribute sound waves evenly throughout the interior.

The elevated pulpit with the acoustic reflector ensures strong direct sound.



Imatra church has a raised source with sound reflecting surfaces made out of massive materials which provides for a strong direct sound and good sightlines.

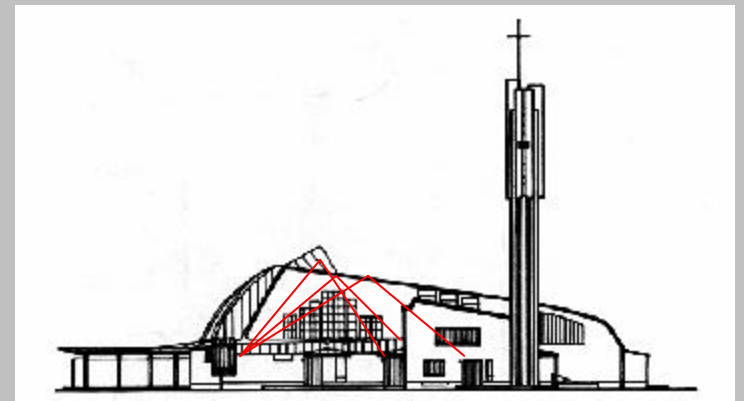
The fan shaped layout minimizes the distance to the source.



Loudness



Concrete provides a thick, massive backdrop for the sound to bounce against in the ceiling above the speaker. This helps the ability to distinguish different sound qualities.



Notice the extra “lip” that provides for better reflection from the speaker. The floor is in this location made out of marble for the same reason.

Clarity



The large volume of the room, the hard surface and the articulation of the surfaces to diffuse sound accomplishes a good reverberation.

From listening to music in the space the reverberation time seems to be from 1.75 - 2 seconds, which makes for a good sound quality.

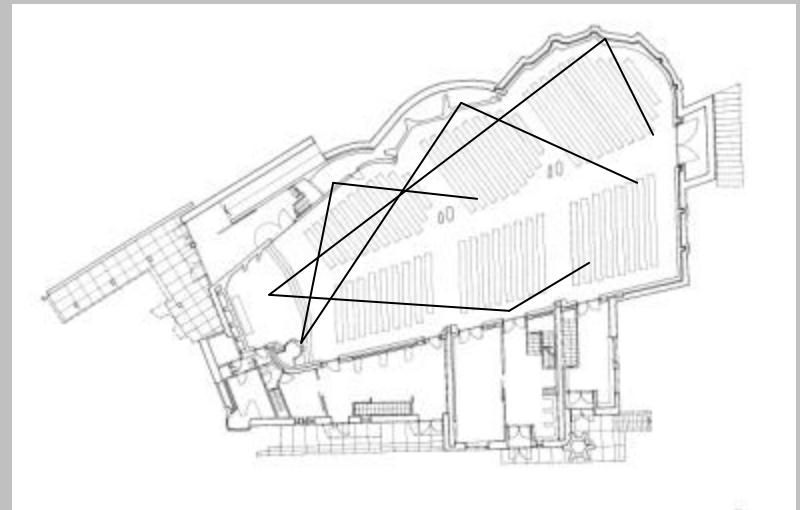
Calculated reverberation time is 1.79.

Reverberance



The source is being contained within a small space that opens up and widens the perspective.

The narrow hall with hard surfaces that also undulates provides for good sound reflecting from the sides.



Envelopment



Many factors provide for good spaciousness, most of them are part of this church design such as: strong lateral reverberance, articulation on different scales and large room volume.

The walls are not parallel but rather designed in an undulating pattern of three curves that moves sound through space.

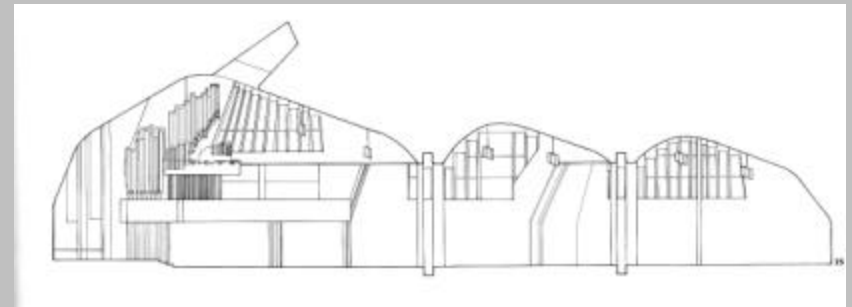
Moving around in the space, the sound seems to be of good quality in every one of the three separate but joined spaces. The shape of the walls and ceiling blends the sound in a good manner.

Spaciousness



The proximity to the source and the room surface surrounding you become part of the sense of intimacy in this church.

The speaker is only a couple of steps away from the audience and the white walls provide a sense of security as well as a way of bringing in the northern light.



The undulating roof and walls provide for an ability to separate the spaces. The form of the building therefore provides for an intimate relationship with the speaker.

Intimacy



Massive materials become carved space. Along with the multiple scales of articulation this accomplishes a richness of sound in high and low frequencies.

The carved concrete walls provide for openings that diffuse the sound and brings it back out to the audience. The church has many windows and wood details that mediates the sound in a good manner.

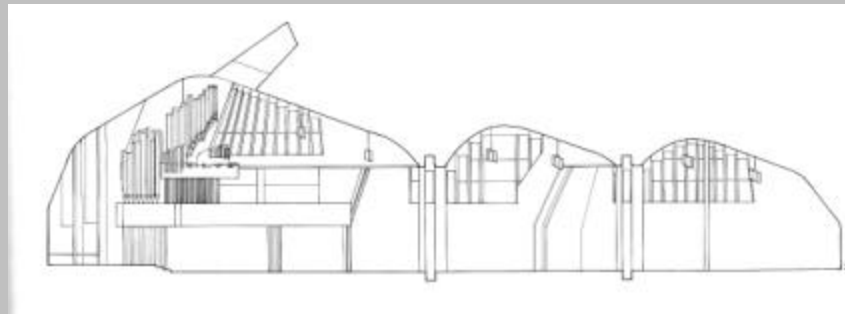
Warmth and Brilliance



The blending of sound through surface articulation, ceiling and wall reflections and surfaces creates an ensemble that forms an acoustic composition.



The undulating forms allow musicians to hear across the stage, it also provides for blending of the sound that is transmitted to the audience.



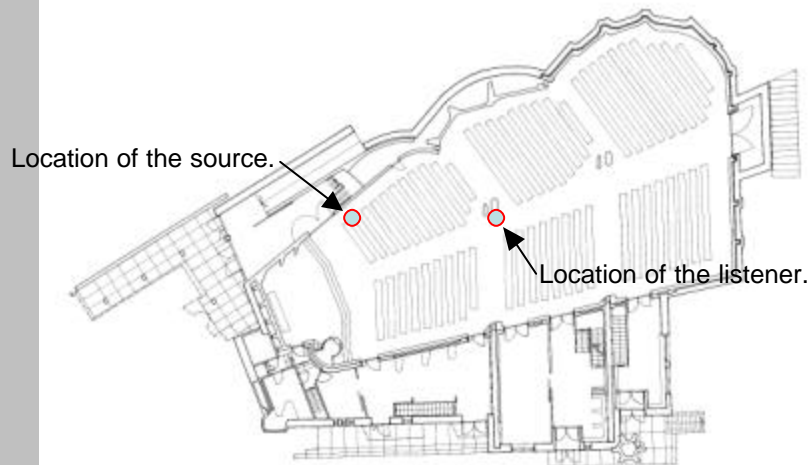
Ensemble



Clear sightlines, raised source and the strength of the direct sound reflected helps us localize the sound source. Imatra church provides all of these features for a good quality of sound.



Click on image to listen to music recorded at Vouksenniska church. The overall quality of the sound is good, especially the clarity, reverberance and intimacy.



Localization of Sound

bibliography

- <http://www.seurakunta.org/imatra/kirkkoalueenglanti.htm>
- Cavanaugh & Wilkes. Architectural Acoustics Principles and Practice. John Wiley and Sons, New York, 1999.
- Beranek, Leo L. Concert Halls and Opera Houses: How They Sound. Acoustical Society of America, Woodbury, New York, 1996.
- Weston, Richard. Alvar Aalto. Phaidon Press.
- Reed, Peter. Ed. Alvar Aalto: Between Humanism and Materialism. MOMA, Distributed Art Publishers.