Potential Use of Timber in Space

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Introduction

The idea of this project is based on my previous studio project: Timber in the City. I was asked to use timber as the main material in my space design. The innovation of timber should not only in structure for architecture, but also interior, floor, insulation, furniture, etc. After visiting the site, I notice the uniqueness of the environment of the site is a horrible fact for living there. Therefore, I focus on researching the possible solution of noise cancelling with wood or timber material.

There are several common techniques apply in noise control wood panel systems, such as increasing the sound touching surface, or reflecting sound wave with angles.

Waffle System

Based on the research on wood walls, I integrated the waffle structural system with wood, and invented five different variations: the normal grid, the deeper grid, the dense grid, and angled grid, and the grid with holes. All of these proposals based on the theory of either increasing touching surface or transferring direction as the way to control noise from my previous study.

Method and Experiment Setup

Simulation setup: spray-foamed plastic box (to avoid noise transferring to exterior), a sound level meter, a speaker, a 26 second traffic clip (1/16'' scaled down)

Result & Analysis

The data recorded from the five experiments indicates the potential of wood waffle grid as a noise cancelling device. The result of the 2x2 waffle grid works as the original data for comparison. It is obviously that the rest of the devices are more or less effective for blocking sounds, which the data of decibel level measured by the meter are all averagely lower than the red (the original). Among all, the wood grid system with angles perform a great job in blocking the traffic sound clip: the data changes subtle and smoothly until the sharpest part appears.

Conclusion

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