

Developing a preliminary evaluation tool to monitor neighboring noise effects from a manufacturing establishment inside the city

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1. Foreword

As collection-type city plans are being pushed ahead, the establishment of technology to evaluate its major external effects beforehand are in demand, for the swift and accurate rating and evaluation of new forms of production/services that will be introduced into abandoned sites in the city and suburbs by the local public body of the site.

Among the various external effect factors, we focused on noise that is generated from manufacturing establishments, and implemented surveys of noise generated by actual manufacturing factories. As well, we developed a calculation sheet that calculates noise levels from any evaluation position outdoors, with regards to generated noise from the manufacturing devices inside the manufacturing establishments.

2. Generated noise surveys of a manufacturing establishment inside the city

Regarding the manufacturing machinery in manufacturing establishments from general purpose types/compact/low-pollution types, we implemented a listing/analysis of typical devices used in various processes, based on catalogs and hearings etc. with regards to the typical machine's size, capacity and generated noise, however, in terms of specific numerical values, the results were not always as clear.



Photo: Noise survey conditions of a manufacturing establishment inside the city
Therefore, we conducted measurements of generated

noise during operations at manufacturing establishments inside the city, including a metalworking factory, a foundry and a printing plant (photo).

3. Developing a forecast calculation software regarding the external effects of generated noise from a manufacturing establishment inside the city

Regarding the noise generated from production equipment from the manufacturing establishment inside the city, a Microsoft Excel-based calculation sheet was created to calculate noise levels from any evaluation point outdoors (Figure).

Test conditions was building placement, sound power levels of the machines, sound insulation performance, and the calculation formula used for the forecast method was a geometrical acoustics method using the "Practical noise measures guidance (Edition 2)" (Architectural Institute of Japan, 1984) for reference.

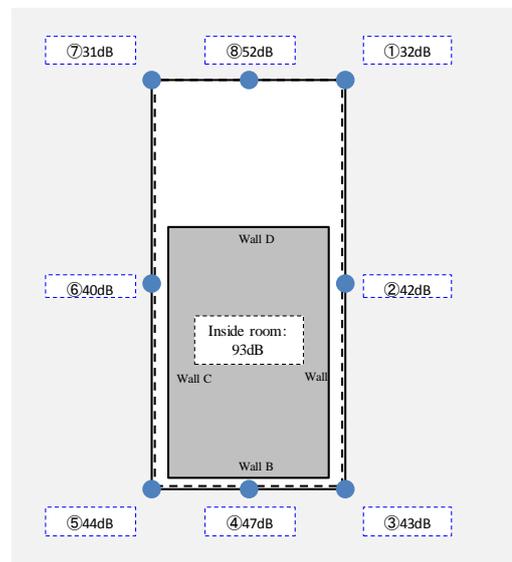


Figure: Output results of the calculation sheet under development (image)

4. Future works

To examine the validity of the calculation sheet, comparisons will be made between the actually measured generated noise and the calculated result, whereupon further reviews will be made to the calculation conditions. Apart from our noise studies, we also plan on

implementing examinations pertaining to the evaluation technology of safe storages for hazardous materials and the incoming and outgoing traffic of small recycling industries.