

Acoustic Examinations of the Hanoi Concert Hall

ハノイ音楽ホールの音響検討



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研究の目的

The Hanoi concert hall was constructed in 2014 and designed especially for classical music. Moreover, it was the first concert hall requiring highly technical architectural acoustics in Vietnam. At the time, we had the chance to support this project involving architectural acoustics from the drawing board stage in 2010 until the end of construction in 2014.

This paper shows how the acoustic needs of this concert hall were met, e.g. in terms of reducing traffic and indoor noise, adjusting reverberation time and electro-acoustic and so on. The acoustic examinations to meet these requirements were performed on a step-by-step basis throughout the drawing and construction period. Ultimately, this project was realized and the new concert hall now has first-rate architectural acoustics.

研究の概要

①Draft stage

Outdoor and indoor noise reduction was examined.

We supposed mounting a double-layer door should be installed for the sound insulation of outdoor noise in order to keep the interior noise level under 30dB. One absorbent chamber was added to each supply-air duct between the machine room and interior. Based on these measurements, we assumed the noise from the air-conditioning system would be lower than 30dB at the hall floor level. The predicted Reverberation time (RT) almost matched the value required by the customer. Acoustic problems such as flutter- or long-pass echo have to be prevented in concert halls, hence a geometric simulation method (software: ODEON) was performed to reveal the fundamental acoustic conditions of the Hanoi concert hall. Electro-acoustic system must cover the control room, backyard area, public zone and management room as well as the main hall, meaning it has to take connections between these areas into consideration.

②Construction stage

After installing inner material, a hole for piping and ducting would be concealed and hard to modify. Accordingly, it is crucial to check various parameters at each stage to maintain acoustic quality. When such inspection reveals any acoustic problem, adjustments should be designed in advance.

結論

Thanks to continuous effort made over more than 15 years to build this concert hall, the acoustic quality is almost perfect, although there is room to improve the process of acoustic examination. Despite the lack of acoustic data for construction materials in Vietnam, which hampers efforts to estimate acoustic conditions in advance, this situation would be resolved in the near future.

While we discuss from the engineering perspective, the Vietnam side accustomed themselves to think and examine aspects in terms of acoustic quality control through this project.

Finally, we got the appreciation of the famous player, Dang Thai Son, concerning the “HIBIKI” of this concert hall.

We hope that the second and third Dang Thai Son would appear in future when this concert hall is complete.

