

Acoustic design of Hakuju Hall

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Hakuju Hall was designed as a chamber music hall suitable for from solo recital to small-scale orchestra. In the beginning of the project, the hall concept was required to equip with the architectural design filled with modernism and give high priority to the acoustics. Today, a number of large-scale symphony halls inventively designed are being built. On the other hand, very few chamber music halls have new design concept. In stead, in general they tend to follow traditional excellent hall design adopted in Europe and America to meet the demand for high quality level of the acoustics. By doing so, they can more surely produce average result, while Hakuju Hall made an attempt to adopt the quite unique design, as you see today, incomparable to any halls in the world.

As you know, hall acoustic designing comprises technological and aesthetic aspects. Accordingly, even the halls are modernly designed based on the instinctive aesthetics without considering any logical reasons, very few of them will produce effective result. Taking account of these matters, Hakuju Hall proceeded designing based on the result from our own research conducted on nearly twenty of main music chamber halls at home and abroad in conjunction with the acoustic designing method of symphony halls, which made a remarkable progress for the past decade.

As a result, we established our acoustic concept to be included in the architectural design of Hakuju Hall as follows;

- clear sounds contributing to the delicate music featured in the chamber music
- reverberation suitable to the hall with the accommodation of 300 people
- hall tone and sound texture filled with spatial and intimate atmosphere
- preferable sound reflection to the performer and the stage comfortable to perform

For instance, the clearness of the sounds is available by maintaining the flat shape adopted in the Shoe Box Hall representing a classical standard of European halls and putting the roof at the suitable height for the shape. Reverberation is typically shown by reverberation time, while Hakuju Hall adopted the chairs with high quality of sound absorption for the purpose of comfortable seating. The enforced wall resilience keeps the balance between the acoustic feature of the chair and the reverberation. As a

result, reverberation time is equal on both occupied and vacant seats. That is, both rehearsal and actual performance can receive almost the same reverberation and there is another advantage that rehearsal or recording can be effectively carried out. Hall tone and texture, the most essential factors contributing to the hall's originality, are provided by adopting glass wings, the grooves on the side wall corresponding to five lines of music sheet and ship-bottom-shaped roof deformed. Finally, the acoustics on the stage essential to a good performance is prepared by the curved glass object on the back of the stage and the side wall on the stage slightly expanding toward the audience seats.

Thus, Hakuju Hall incorporates architectural design with almost 100% of the acoustic idea, that is to say, every interior in this hall has the acoustic meaning.

In actual designing, we minutely and objectively examined the design using the best kinds of physical means available at present such as computer simulation, scale model experiment and experiment using significant real acoustic materials. In March 2003, when its interior construction was completed, we carried out the performance, so that related parties could evaluate the sound at the hall by actually hearing the sound and discussed the necessity for the final acoustic tuning, and it was fully completed as it was today. From now on, Hakuju Hall will go through aging term for about six months to be open. We believe that this project was proceeded with satisfactory designing process and our original aim was fully achieved as well in collaboration with our passionate client of this hall construction and excellent architects.