New Concert Hall Opens in Katowice, Poland

By Dr. Yasuhisa Toyota

In last month's newsletter I wrote about the opening of a new hall in Shanghai and this month, in quick succession, I will write about the opening of another new and significant concert hall. On October 1, 2014, a new concert hall opened in Katowice, Poland. Katowice is located in southern Poland in an area also known as Upper Silesia. The city functions as a regional hub and is home to 300,000 people. In the early 20th century the city flourished as a center of coal mining production but when the coal mining industry fell into decline in the later part of the century so did the city. The catalyst for Katowice's revival has been culture and the arts.

Figure 1: New Concert Hall in Katowice

The History of NOSPR in Katowice

In addition to the general goal of promoting the performing arts in Katowice, there was another good reason to build a new concert hall in this city. Poland has two national orchestras. One is the Warsaw Philharmonic Orchestra, based in that city, and other is the Katowice-based "Narodowa Orkiestra Symfoniczna Polskiego Radia w Katowicach", or "NOSPR", the Polish National Radio Symphony Orchestra.

NOSPR was originally founded in 1935 in Warsaw, but its activities were interrupted by the outbreak of World War II. When the orchestra came together again in 1945 it did so in Katowice, where it continues to make its home through the present day. From its very beginnings until the recent opening of the new hall in Katowice, the dream and aspiration of the orchestra and its players has been to perform in a concert hall with fine acoustics that they can call their own home hall.

Project Participants

In December, 2008, the local Katowice architectural firm of Tomasz Konior won the competition for the role of project architect. In addition, the project had the ongoing support of internationally renowned Polish pianist Krystian Zimerman who was born actually in this region, who served as advisor to the project. Mr. Zimerman builds his own pianos and tunes them himself for his concert performances, demonstrating both his keen knowledge of his instrument and his intense particularity about the tone colors of the pianos he plays.

Figure 2

Figure 3

Interior of the Concert Hall

Mr. Zimerman's interest in acoustics also extends to concert hall acoustics. He devised his own acoustical measuring device for halls and he has taken the device to halls around the world to gather acoustical data. In his capacity as advisor to the Katowice Hall project, Mr. Zimerman proposed that Nagata Acoustics be awarded the acoustical consulting role on the project. Because of his recommendation, we were invited to join the project team.

Tomasz Konior had collaborated with local acoustical consultant Pracownia Akustyczna to prepare the architect selection competition's winning design, so portions of the project were also awarded to this consultant. Specifically, we designed the room acoustics for the 1,800-seat main hall and Pracownia Akustyczna was awarded responsibility for the small hall's acoustical room design as well as the overall sound isolation and noise prevention design and the halls' sound system designs.

Room Configuration of Katowice Main Hall

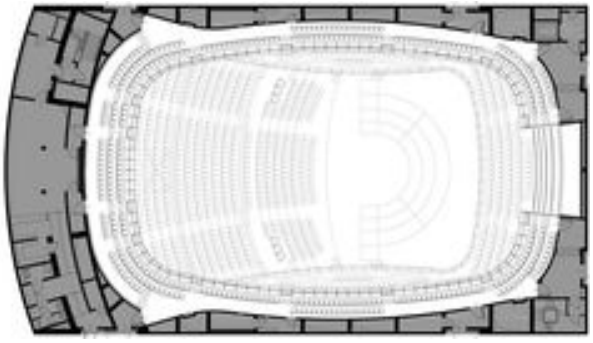

Figure 4: Plan of the Concert Hall

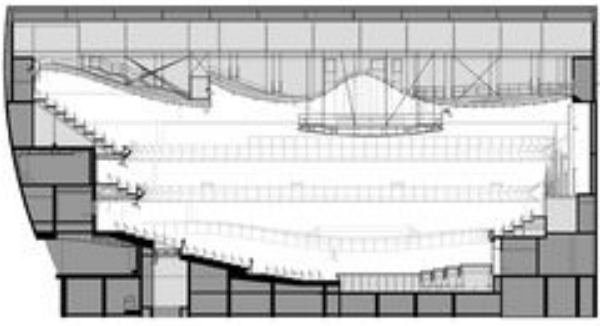

Figure 5: Longitudinal Section of the Concert Hall

The winning proposal of the project's architectural competition featured a traditional shoebox configuration for the main hall and the early stage of the project proceeded with this design. When we joined the project we reviewed the plans and offered a number of recommendations. As a result of this review process, our design of the main hall continued to use the shoebox configuration as a starting point. Nevertheless, we adapted the configuration by increasing the width of the hall beyond a typical shoebox shape and adding audience seating around all sides of the

stage.

In revising the main hall's configuration, our foremost consideration was how to shorten the distance between the audience seating and the stage. The purpose of this objective was to increase the sense of intimacy from the visual and acoustical perspectives. The result can be seen in the plan and section diagrams (Figures 3 - 5) that accompany this article. The main hall has a total spatial volume of 22,000 cu. m. (776,923 cu. ft).

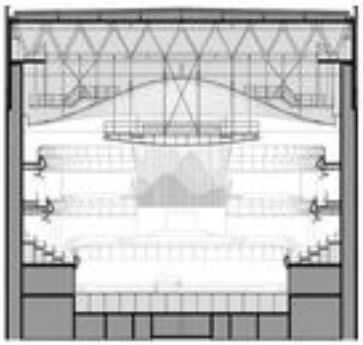

Figure 6: Cross Section of the Concert Hall

Initially, the management of the new hall's resident orchestra, NOSPR, disliked the idea of placing seating on all sides of the stage. However, as part of the design planning process the NOSPR's management visited Copenhagen's Danish Radio Concert Hall, a project that we completed in 2009. After experiencing a rehearsal and actual concert with the Danish National Symphony Orchestra in the Danish Radio Concert Hall, the NOSPR's management changed their opinion of the planned design and enthusiastically supported our proposed audience seating arrangement.

Preventing Echoes and Obtaining Rich Reverberations

For the most part, we did not install sound absorbing elements in the Katowice main hall. However, because our 1/10 scale acoustic model testing, we conducted in the late design process, predicted that sound reflections from the rear wall of the hall would generate some echoes, we installed sound absorption material on portions of that wall. At the completion of construction we took acoustical measurements in the hall and obtained a sound reverberation time of 2.3 seconds (in an empty hall, at 500 Hz). The reverberation time of the full hall is 2.1 seconds at 500 Hz (calculated value based on the measured empty hall value).

NOSPR First Day in Their New Home

The orchestra held its first rehearsal in the new hall at the end of August. At the start of the session I could see the players looking nervously from one to other as they began to play. Inevitably, this is the most stressful moment of a new concert hall project.

Every new concert hall and its resident orchestra traverse a period of time that might best be called a birthing process. The orchestra begins to play and, as hours pass, the players become accustomed to their new surroundings. As each individual player becomes comfortable with the new acoustics, the ensemble's sound coalesces and its fine and distinctive personality takes advantage of the new hall's acoustics. As this evolution continues, the orchestra increasingly gains confidence and satisfaction with the new hall's acoustics.

What differs about the birthing process from one hall to the next is a question of degree. Different orchestras take more or less time to acclimate to their new acoustics. In the Katowice main hall I saw this process evolve first

hand and I noticed something else that differed from most other first days I've attended. From the very first notes, I immediately heard good balance in the NOSPR's ensemble. And—as might well be expected because of this good start—the orchestra's players began to express their appreciation of the new hall's acoustics from the beginning of their first rehearsal.

Our biggest test of the new hall's acoustics came during this first rehearsal when Mr. Zimerman took the stage. Because of this pianist's stature in this area of his birth, it is safe to say that for the hall's acoustics to be well received by all, we needed a thumbs up from Mr. Zimerman.

Happily, Mr. Zimerman could not have been more delighted with the new hall's acoustics. He returned to the empty hall on the evening before its opening night and—alone on the stage of the new hall—played for hours late into the night. As the principal acoustical consultant on the project, I can truly say that when Mr. Zimerman gave his approval of this hall's acoustics I breathed a sigh of relief. I am glad that this project came to such a successful conclusion.

More information about the new concert hall and the NOSPR can be found on the NOSPR website.