

## Elbphilharmonie Opens in Hamburg / Special Edition

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### The Opening

In Germany's second largest city, Hamburg, the new concert hall venue Elbphilharmonie opened on January 11, 2017. Historically, the city of Hamburg developed as a port and commercial city on the Elbe River that connects the port to the North Sea. Facing directly on the Elbe River, in a district where old warehouses faced the river and that has become one of the most significant parts of the city, the Elbphilharmonie concert hall now stands prominently on the waterfront. Hamburg is a city rich in classical music associations, being the birthplace of Mendelssohn and Brahms and the sometime home of many famous composers, including Telemann and Mahler among others. It is also the city where Steinway & Sons manufactures its pianos.

A full 14 years elapsed from the inception of the Elbphilharmonie project in 2002 to its January, 2017 opening, and 12 years have passed since Nagata Acoustics joined the project in 2004. Compared with projects of a similar type and scope in which I participated, Suntory Hall took 6 years to reach its completion in 1986, and Disney Concert Hall (in Los Angeles) took 14 years from its beginning until it opened in 2003.

Elbphilharmonie and Disney Concert Hall each encountered a hiatus due to special situations that stopped progress on those projects for a period of time. Even in the best of circumstances, a major concert hall cannot be simply completed in the 2 or 3 years that are sufficient to construct an office building or residential housing.



Figure 1: Exterior



Figure 2: Facility Structure

On a concert hall project, even if every part of the process proceeds smoothly, it can be expected that the shortest possible schedule needs 2 to 3 years for the design phase and another 3 years for construction. Add to this several months to 1 year for planning and conceptual design at the beginning, and at least several months of post-construction opening preparations, and 7 years becomes the minimum time needed to complete a new concert hall from the start of the project to the hall's opening. At the beginning of concert hall projects, the project duration and costs are often not sufficiently budgeted, but instead begin with overly optimistic schedule durations and financial budgets. If this wasn't the way things happen, it seems that some projects would not get started in the first place.

### Architectural Design and Acoustical Design

The building that houses Elbphilharmonie has 26 stories and a total floor space of 120,000 sq. m. (1,300,000 sq. ft). The building comprises a 2,100-seat "Grosser Saal" (Large Hall), a 500-seat "Kleiner Saal" (Small Hall) and ancillary spaces, as well as a hotel and condominiums. At the height of the eighth floor, the building offers incredible 360-degree vistas of the city and the Elbe River. On this level, a Plaza offers access to the general public and also serves as the entrance to the "Grosser Saal" and "Kleiner Saal" built on the floors above the Plaza.



Figure 3: Grosser Saal



Figure 4: Kleiner Saal

We designed the "Grosser Saal" as a concert hall for classical music and we planned the "Kleiner Saal" as a multi-purpose hall with the focus primarily on chamber music and appropriate acoustics for a wide range of performances and events such as popular music genres, drama and lectures. The Swiss architectural firm of Herzog & de Meuron created the Elbphilharmonie project's architectural design. Hochtief AG served as the general contractor. Nagata Acoustics provided all acoustical consulting services to the project from the design phase through construction and project completion.

The design of the concert hall's room acoustics might be summarized as comprising 2 important areas, the "room's shape" and the "room's interior design materials". Of course, consideration of the concert hall's shape includes both the major elements of ceiling height, room width and overall layout, and also such details as surface variations along the ceiling and walls—that is, every visible element that has a specific physical shape. The concert hall's interior design materials include not only the materials and finishes that are visible to the eye, but also the structure and properties of the underpinnings and backings of every interior element. The room acoustics design must address all of these elements, but it is also true that the same elements—the room's shape and its interior design—are the

focus of the architectural design. Therefore, designing the interior of a concert hall needs to be a single collaborative process of the architectural and acoustic designs.

In approaching the design of Elbphilharmonie's interior, we identified the concept of "intimacy" as our keyword. From both the architectural (that is, visual) perspective and the acoustical perspective, we sought to achieve "closeness". Because of the size of "Grosser Saal", the question of how to make the audience feel "not distant" from the performers became the most important theme of our design work. When Nagata Acoustics joined the project design team, the project had already decided that the basic shape of "Grosser Saal" would not be the "shoebox" configuration, but instead, would use the so-called vineyard configuration to seat the audience as close to the stage as possible.

For our room acoustics design, achieving acoustical "intimacy" most importantly meant how to obtain effective and valuable early sound reflections and, to do this, how to create acoustically effective walls around and in the vicinities of the sections of audience seating. Our design solution involved creating small groups of audience seats and designing effective, sound-reflecting wall surfaces for every group of audience seating.

### **Acoustical Testing**

Critical assessments and judgements about the excellence or failings of a concert hall's acoustics do not come from people reading data sheets with reverberation time and other numerical measurements of physical properties. Ultimately, individuals seated in audience seats listen to performers playing music on the stage and the audience, by listening to the music, evaluates and judges the acoustics.

It might be thought that the acoustical consultant attends a hall's opening night performance as if "sitting on pins and needles" with tense concern about how the acoustics will be received, but this is not accurate. Usually, the most tense moment for the acoustical consultant occurred months before the opening night, at the first rehearsal held in the hall. This is also arguably the worst time to test or judge the acoustics of a concert hall. The reason is that the performers are unfamiliar with the hall's acoustics, do not yet know how their playing will sound in the hall and do not yet know how to listen to the music of their fellow performers, so the first rehearsal in the hall almost invariably begins with fumbling around in the new environment.

The first rehearsal in the hall is the worst time to test the new hall's acoustics. The time that the ensemble's musicians spend listening to each other and creating the ensemble's special sound is all in the future. If the first rehearsal is the worst time to test the hall's acoustics, the second rehearsal is always an improvement over the first rehearsal and at the third rehearsal we always hear how things are improving and coming together. When I am asked how long should the rehearsal period be in a new concert hall before the official opening, my instinct is to answer "as long as possible". But while I would be delighted for ensembles to spend years rehearsing in a hall before their first public performance, I know that this would be an unrealistic answer. At a minimum, an ensemble should spend 2 to 3 months rehearsing in its new hall and, when possible, rehearse for 6 months in the hall before the hall officially opens. In keeping with these guidelines, the Elbphilharmonie project schedule gave the NDR Elbphilharmonie Orchester 4 months of rehearsal time in the new "Grosser Saal" before opening night.

## Orchestras and Concerts beyond Opening Day

It was decided from the planning phase of the Elbphilharmonie project that the new hall's resident orchestra would be "Norddeutscher Rundfunk (NDR) Symphoniker" (the North German Radio Symphony Orchestra). For the orchestra and the hall, the resident orchestra's relationship to the hall refers to something other than a commitment to perform a subscription concert at the hall on a monthly basis. For Elbphilharmonie and its resident orchestra, the resident orchestra relationship means that the orchestra will use the "Grosser Saal" stage on a daily basis to rehearse. The orchestra and the new hall will develop together with the hope and expectation that the orchestra will become the "face" of the new hall. One way that the NDR Orchestra revealed how deeply it understands its role and new beginning has been through its renaming of itself to its new name of "NDR Elbphilharmonie Orchester".



Figure 5: Grosser Saal Grand Opening

In addition to performances by the "NDR Elbphilharmonie Orchester", the city's other orchestras: the Philharmonic State Orchestra Hamburg (which plays under the name Hamburg State Opera Orchestra when playing in the Hamburg Opera House pit), and the Hamburg Symphony Orchestra will both move their monthly subscription concerts to Elbphilharmonie. However, while both of these local orchestras will hold monthly performances at Elbphilharmonie, they will use the hall only on the days of their performances and will rehearse in other locations. In this way, their relationship to the Elbphilharmonie differs significantly from that of "NDR Elbphilharmonie Orchester".

In addition to performances by Hamburg's 3 local orchestras, an impressive array of invited musicians and ensembles will come from around the world to give concerts at Elbphilharmonie. The organization responsible for planning the new hall's calendar of guest performers is "Hamburg Musik", which is an agency of the Hamburg municipal government and the same organization responsible for the Elbphilharmonie's daily operations and maintenance.

The official opening of Elbphilharmonie marked the accomplishment of the goals of an incredible architectural project. At the same time, for "NDR Elbphilharmonie Orchester" and the "Elbphilharmonie, Hamburg Musik" organization the hall's opening is the first milestone of a new era of future musical accomplishments and possibilities.