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“Great Amber” Concert Hall, Liepaja, Latvia

Construction and thermal building physics

The Concert Hall is a concrete sculpture, cladded in and enveloped by a self-supporting variably tilted glazed façade. This façade consists of an interlocked wide flat steel structure that connects with the concrete sculpture in the roof area (resting upon the concrete sculpture).
Structurally, the building is a reinforced concrete folded plate structure with a double-shell glazed façade and interior steel construction.
From a physical point of view, the double-shell property of the façade enhances its thermal energy balance by approx. 10° to 15°C.
Due to the existence of thermal overpressure between the outer and inner façade, soiling of the façade’s intermediate space can be largely ruled out. The approx. 80cm wide space between both façades is equipped with grids for service purposes.
The outer façade made of frameless laminated safety glass containing an intermediate fourfold foil is held in place by steel glass clamps supplied by the Austrian Längle company. These clamps guarantee that the threefold wind force is withheld, as compared to a normal wind force, e.g. in Austria.
The inner façade consists of transparent double-glazing with bonded vertical joints.

The lighting concept

A combination of four differently coloured foils, whose light spectrum was ascertained by Innsbruck-based Bartenbach company in many tests, yields a range of light reflections from yellowish-white to orange and reddish brown, depending on light incidence and reflection of the amber coloured façade. To the onlooker outside, the Concert Hall with its surrounding spaces resembles an insect encapsulated in a piece of amber.

One special feature is the lighting of the stage area in the Concert Hall. Normally, concert halls are always dark, as they have no access to daylight. Great Amber project in Liepaja, however, responds to the special wish of the principle conductor to be able to conduct by daylight. Fourteen so-called light pipes, each with a diameter of over one metre, ensure that the concert hall receives sufficient daylight. The interior of these light pipes consists of a highly reflective steel lining which augments natural light to such an extent that a unique spatial atmosphere is created when the sun shines, filling the space with brilliantly intense, yet evenly distributed daylight. When the weather is cloudy, the pipes provide diffuse, shadow-free daylight, too, thus conjuring up various moods and effects inside.
During the White Nights in summer, when the sun sets briefly, evening concerts can take place in daylight. With the aid of a black out mechanism, light incidence can be regulated gradually. Besides achieving an optical effect, daylight illumination also has a practical purpose. No artificial light is needed for orchestra rehearsals largely taking place during the day, thus considerably saving energy costs. Moreover, since it is a multi-purpose venue, the Concert Hall is also suitable for congresses and festive events held during the day.

The acoustic concept

The acoustics concept was developed together with Müller-BBM, Munich. The grand Concert Hall has a seating capacity of over 1000. Its acoustically effective volume is around 11,200 m³. When the hall and the orchestra podium are fully occupied, reverberation time still reaches 1.8 to 2.0 seconds, increasing again towards the lower frequencies, thus lending the necessary warmth to the sound. Perfect conditions for classical concert performances. With its tiers and balconies, the form of the hall follows the classic terraced vineyard pattern, thus enabling intimate proximity to the artists on the podium while everyone in the auditorium still enjoys the full spatial acoustics, no matter where they sit. Filigree decorative elements on the ceilings and walls effect a diffuse blend of acoustics for well-balanced sound quality without excessive clarity.

The Chamber Music Hall has a seating capacity of 180 and an acoustically effective volume of 1200 m³, guaranteeing well-balanced and sophisticated sound quality at chamber music performances.

Behind large white acoustically transparent wall coverings made of fabric, variable sound absorbent curtains are used to reduce long natural reverberation times in both halls.
Together with permanently installed public address systems, this type of sound absorption ensures very good speech and consonant intelligibility in both halls. It is therefore possible to use the concert halls, especially the larger one, for non-musical events such as conferences, lectures and congresses.

Stage - Technic

The orchestra pit of the Concert Hall consists of a vertical mobile orchestra platform.
Should it be necessary to enlarge the platform substantially from 60m² to 230m² in order to accommodate a full-size orchestra, this can be done by dismantling the first three rows of seats in the stalls. In that way, it is possible to perform maximum-size orchestra and choir works.
For various events such as congresses or balls, the floor of the Concert Hall can be brought to a single level by mechanically elevating the orchestra platform. The lower stepped stalls are lifted to stage level with the aid of lifting equipment.

In order to be able to cope with the many different technical requirements of various scopes of use, the installation of a multi-functional grid containing attachment points, freely positionable point hoists and permanently installed lifting frame hoists has been planned for the acoustic reflector above the orchestra and stage platform areas.

The acoustic reflector (90m²) above the auditorium is mounted permanently, while the height of the reflector above the platform (140m²) can be altered according to acoustic requirements. Decorations and technical equipment such as screens, sound reflectors and loudspeakers, etc. are moved to the technical level in the ceiling area using machine hoists.

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