

## The design for new building of Estonian Public Broadcasting ERR

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This paper describes an ongoing project of the new Estonian Public Broadcasting building. The new modern broadcasting complex comprises radio and TV studios, chamber music hall and a variety of different production facilities. The aim of the project is to join separately located Estonian Radio and Estonian Television into one building. The area of the building is almost 46000 m<sup>2</sup> and there are four main floors. Architect Erik Nobel's main idea was to compose a creative working environment, which is achieved with a transparent glass facade that surrounds all of the building. All acoustically important rooms are situated in the center of the building and less important on the perimeter close the glass facade. According to the architectural solution monolithic concrete walls are only for four TV-studios, chamber music studio, pop music studio, radio theater complex, stairwells and utility shafts. Other walls are mainly lightweight walls. The architect of the ERR building is Nobel arkitekter A/S from Denmark and the main designer is AS EA Reng from Estonia.

### 1 Introduction

The new Estonian Public Broadcasting ERR building is the result of a long standing need to join all public broadcasting premises/facilities. Today ERR represents two TV-stations, five radio stations and many internet news and theme portals, which are located in 3 different buildings.

Open architectural competition for the new building of Estonian Public Broadcasting took place in 2007. The architectural competition had 14 entries, 12 of them fulfilled the criteria. Name of the winning work was "Ring-Hääl-Hing" (*circle-voice-soul*) by Danish architectural company Nobel Arkitekter A/A, main architect Erik Nobel.



Figure 1: First prize of architectural competition (Nobel Arkitekter A/S, "Ring-Hääl-Hing")

The architect's main idea was to compose a creative working environment, which is achieved with a transparent glass facade that surrounds all of the building.

The use of the building is around the clock, 365 days a year, office spaces near the façade are used predominantly 7 to 23.

The new building has four main floors, basement with technical and parking basement and partly fifth technical floor. On the first floor there are TV-studios, chamber music studio (Studio E), pop music studio (Studio F), radio theatre studios and surrounding secondary rooms, on the second floor there are administrative premises and additional studios for radio theatre. On the third floor there are round News studio, radio studios, presentation room and open office area, on the fourth floor there are self-op studios, small recording studios etc. Inside the building are located six internal gardens, which are open from above.

Our work as an acoustical consultant has been giving main acoustical specifications, building acoustical, room acoustical and HEVAC noise solutions.

## 2 Location

The future broadcasting building will be located in Tallinn, Kristiine district. Nearest facade is ~200 m away from one of the most busiest street A.H. Tammsaare tee, ~400 m away from Tallinn - Paldiski railway line and 5.2 km north-east is located Tallinn airport (the western take-off and landing corridors are nearby).

Calculation results indicate that the equivalent traffic noise levels will be up to 60 dB, from the railway short-time equivalent will be ~65 dB and from the aircraft noise the maximum short-time noise level will be ~80 dB.

Based to the calculation results of the environmental noise levels, the sound insulation requirement for the facades vary  $R'_{te,s,w} = 30-38$  dB, suitably for the use of the spaces.

## 3 Architectural and structural scheme

The floor area of the building is almost 46 000 m<sup>2</sup>. Overall dimensions of the building outer surface are 123x120 m; maximum height above ground is 28 m.

All acoustically important rooms are situated in the center of the building and less important on the perimeter close the glass facade. According to the architectural solution monolithic concrete walls are only for four TV-studios (Studios A-D), chamber music studio (studio E), pop music studio (studio F), radio theater complex, stairwells and utility shafts. Other walls are mainly lightweight gypsum board walls. One argument for using lightweight walls is that the building layout could be easily modified/changed in the future exploitation. Planned lifetime of the building is 100 years.

Based on the structural design concrete hollow-core panels are supported with monolith concrete columns.

There are four TV-studios planned to the building, their dimensions are as follows (width x length x height, m):

- Studio A 26,1 x 34,2 x 13,0;
- Studio B 10,3 x 12,3 x 8,0;
- Studio C 17,6 x 25,4 x 9,3;
- Studio D 13,0 x 18,5 x 8,0.

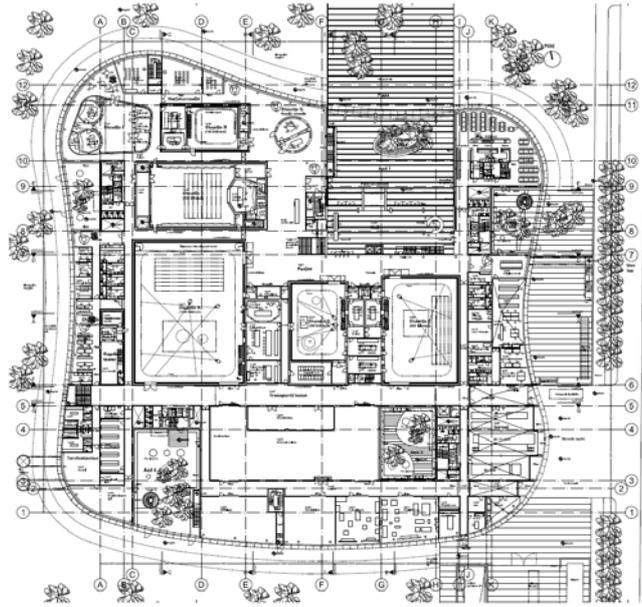


Figure 2: First floor plan

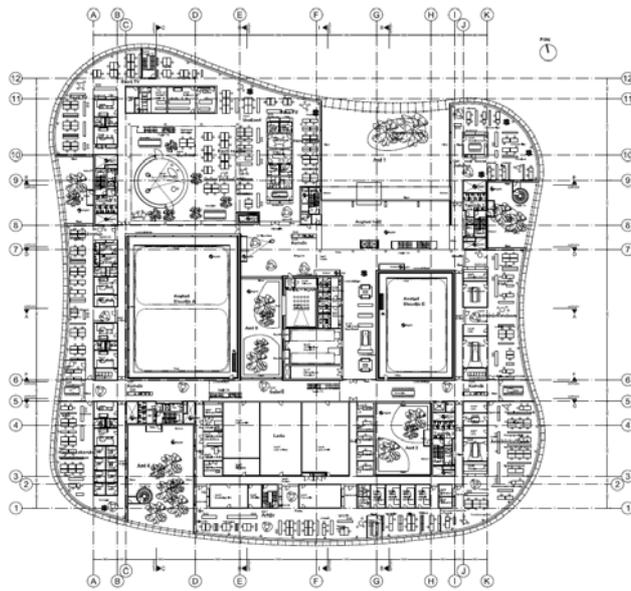


Figure 3: Third floor plan

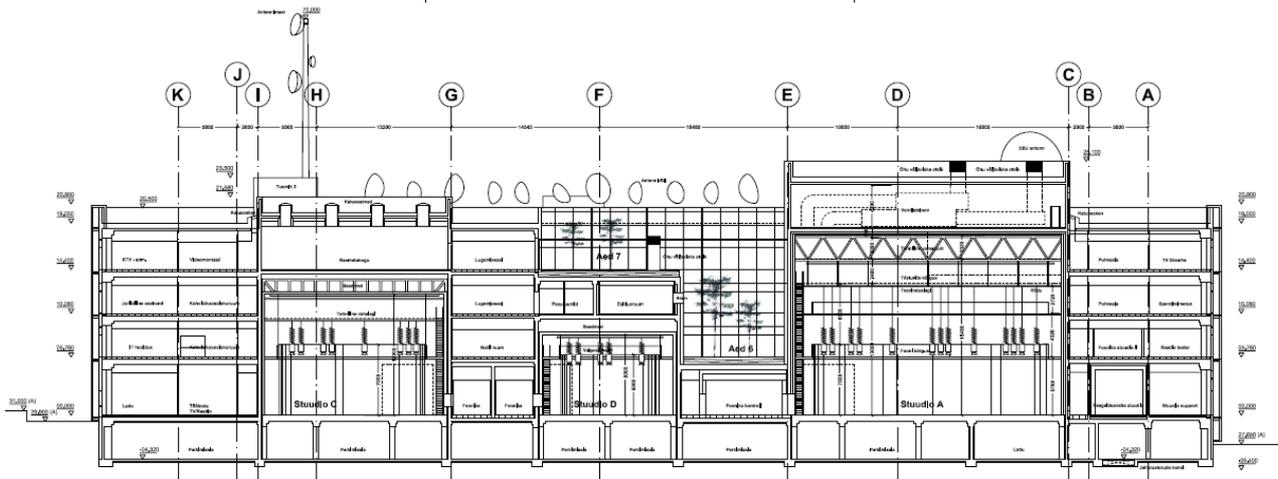


Figure 4: Section plan A-A

## 4 Airborne sound insulation and impact noise insulation, permitted background noise levels

All acoustically important rooms are situated in the center of the building and less important on the perimeter close the glass facade. As can be seen from the figure 1, TV-studios and other studios are drawn together in the middle of the building and they are separated from each other by control premises and/or corridors.

Acoustical specifications for different room types were classified to categories A to F, as category A had the highest airborne and impact sound insulation requirements (also background noise levels caused by HVAC systems), F had the lowest requirements.

Category A includes room types like chamber music and pop music studios and radio theatre complex, category B is for TV-studios, category C is for TV-studio control rooms, other smaller radio and news studios etc.

There are three main types of walls: massive concrete walls, glass walls and lightweight gypsum board walls. TV-studios, chamber music studio, pop music studio and first floor radio theatre complex have walls have massive concrete walls. TV-studios walls are 300 mm concrete, covered with additional gypsum board cladding and room acoustical treatment. All other premises have one or double-stud gypsum board walls with up to three layers of gypsum board on both side of the wall.

Acoustically important rooms have floating floors on mineral wool or on rubber isolators; all open spaces and corridors have access floor systems (space under the flooring panels is used mainly for low voltage cableways).

Background noise limit values for all acoustically critical premises were set as NR- (noise rating) curves; the limit values are for HVAC noise and for noise caused by neighboring studios.

## 5 Room acoustic solutions

Special attention was paid to the design of all studios. Odeon model was made to chamber music studio and for pop music studio. The room acoustical solutions and materials were chosen conjunction with the architect.

Studios A-D have the same room acoustical solution: ceiling and wall surfaces are very absorbing, walls are covered with wooden laths to protect the absorbing material.

Chamber music studio is a 200 seat multipurpose hall with variable acoustics. Reverberation time for chamber music studio has been chosen according to the different types of music to be recorded and presented from 1,0 to 1,6 seconds. The main material used is laminated building boards and variable acoustic has been solved with acoustical movable elements on the side walls.

Big studio of radio theatre complex has variable acoustics, which is solved with acoustical curtains, and with turnable panels, one side is acoustically reflecting and other side is absorbing. Radio studio complex will also have reflection-free (semi anechoic) studio and a Foley studio for effects.

One the problematic studio was a round-shape News studio on third floor (Studio G). The wall surfaces are concave, solution was to use perforated steel plates and diffusive elements on the walls and furniture to diffuse the sound field as much as possible to avoid strong focusing effect inside the studio.

## **6 Summary**

This paper has described the basic solutions for the new building of Estonian Public Broadcasting building.

During the preliminary design and main design phases there was close collaboration between the designers and the client; the architectural design works began in the summer of 2008 and the rest of designers joined the design team in the summer of 2009. Starting from 2009 it took approximately 2,5 years to till the main design was completed. Many design meetings and workshops were held during the design phase, other newly-built European broadcasting buildings were visited to get the better idea of modern broadcasting buildings.

Construction period of the new building is currently unknown.

## **References**

- [1] Nobel arkitekter A/S, Achitectural design, Main Project
- [2] [www.err.ee](http://www.err.ee)