

ACT CITY HAMAMATSU

HAMAMATSU, JAPAN



ACOUSTICAL CONSULTANT:	YAMAHA Ad. Sys. Dev. Center
ARCHITECT:	NIHON SEKKEI, INC., et al.
OWNER:	Hamamatsu City, et al.
THEATER CONSULTANT:	Theatre Workshop
SOUND & COMMUNICATIONS:	YAMAHA Ad. Sys. Dev. Center
ACOUSTICAL DESIGN INSTRUCTION:	Kiyoteru Ishii
CONSTRUCTION COST:	38,000 Million JPY - Entire Facility
COMPLETION DATE:	1994

The Act City Hamamatsu was opened just in front of a main railway station as a base for the activities of new communities in Hamamatsu City. This venue consists of two kinds of halls; 2,336-seat main hall and 1,030-seat concert hall, and other facilities including a conference center, an exhibition event hall, a musical instrument museum, a training exchange center, and private facilities.

Since the halls are located close to the elevated railway tracks, they encounter various acoustic problems, especially vibration problems from the trains. Before and during the construction, we performed the train vibration measurements on the site several times, then various measures were implemented according to these investigations. In addition, the logical predicting methods were developed to evaluate train vibration based on the vibration power concept and to estimate the effects of continuous underground wall/expansion joints.

The main hall was designed as a multi-purpose hall adjusted to music performances like opera and classical music concerts, and other performances like conventions, dramas, light music, etc. as well.

To meet their requirements, the following three ideas have been implemented:

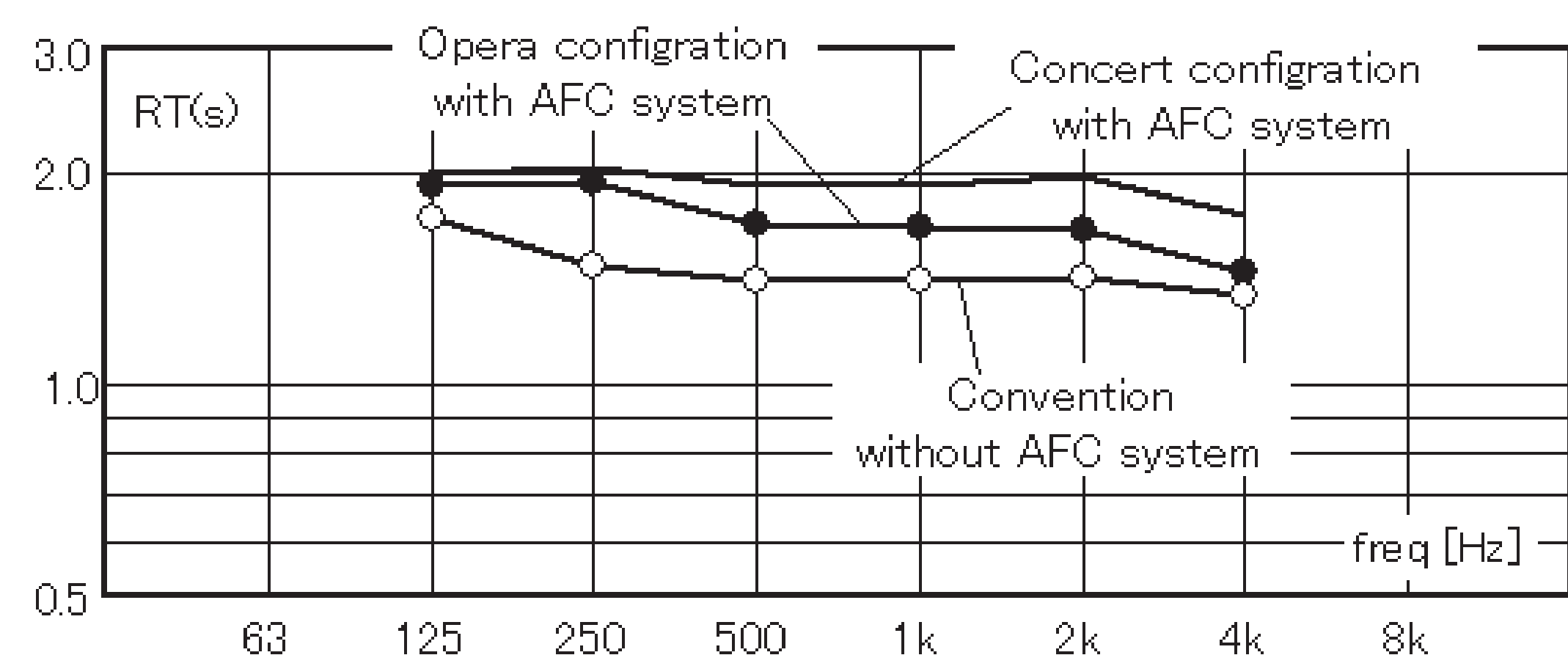
1) Acoustically superior opera house: The hall is based on a rectangular box shape rather than a horse-shoe or fan shape to get sufficient lateral reflections, and composed of three floors with side balconies which can create lateral reflections and also minimize the distance to the stage from any audience seats (less than 34 m) to get a sufficient direct sound and loudness.

2) Acoustic treatment within the stage: The hall has 4 full-scale stage floors and can change sceneries easily. The volume of the stage is approximately 50,000 m³. Acoustical shutters have been installed between these stage floors, to control sound insulation and room acoustics like reflections for singers and liveness in the stage space during opera performances. Also, sound absorption treatment has been made in order to avoid excessive reverberation at the low frequencies during other performances without the stage reflectors such as rock concerts, speech, etc.

3) Multi-function Active Field Control (AFC): It is difficult to obtain sufficient loudness and reverberance for music performances like opera and classical concerts in large multi-purpose halls only by architectural means. In order to realize the sound field optimum for both performances, AFC system has been installed. In addition, the uniformity throughout the entire room can be realized by AFC system. The live sound field in the main area is extended to the under balcony area and also sound energy is exchanged between the stage and audience area using two independent systems.

CRITICAL DATA

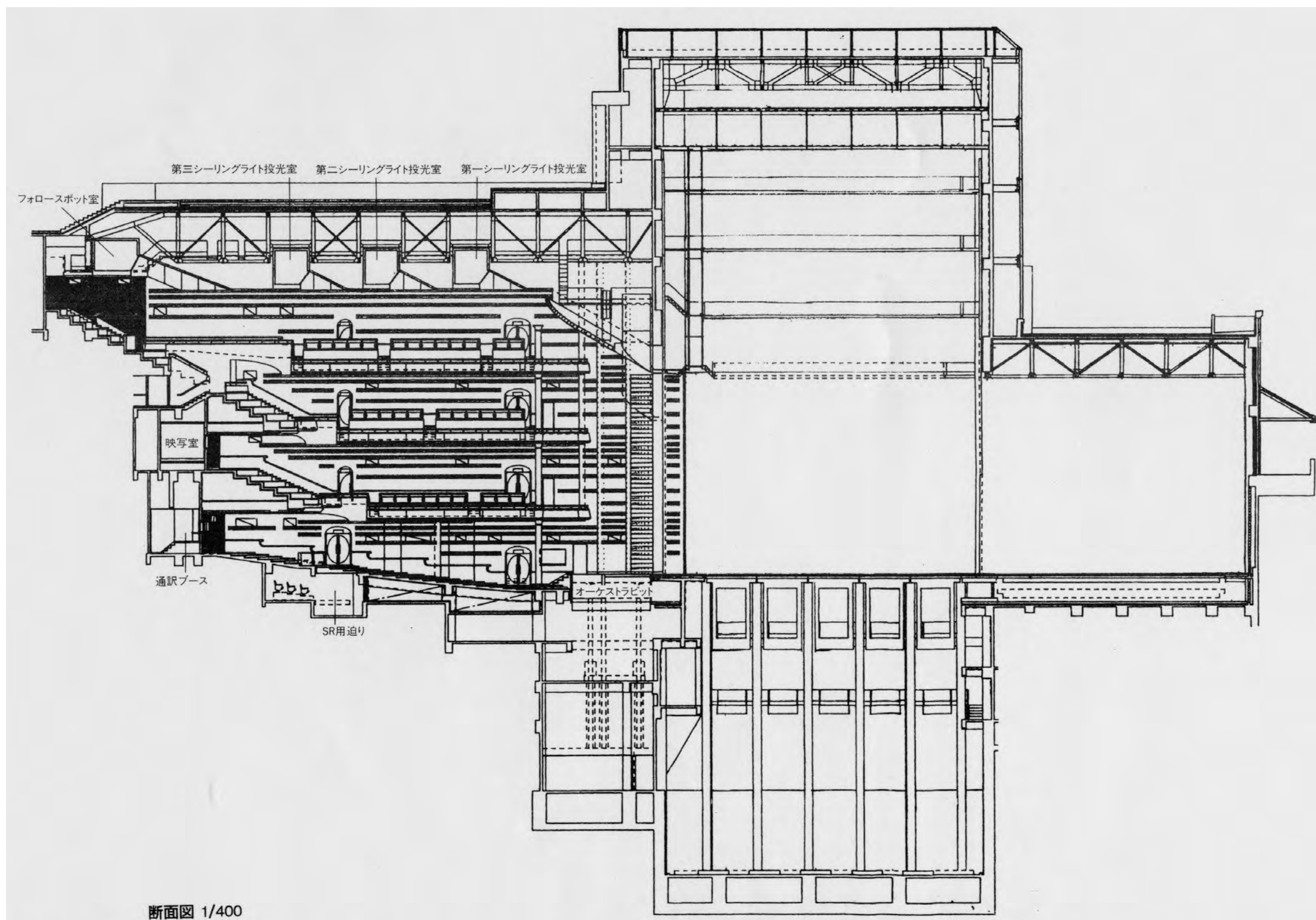
Seating Capacity	2,336
Volume	20,839 m ³
Surface area	7,602 m ²
Noise Level	NC-20
Definition (250 Hz-2 kHz ave.)	47 %



Estimated values for RT from measurement values are in the occupied condition.

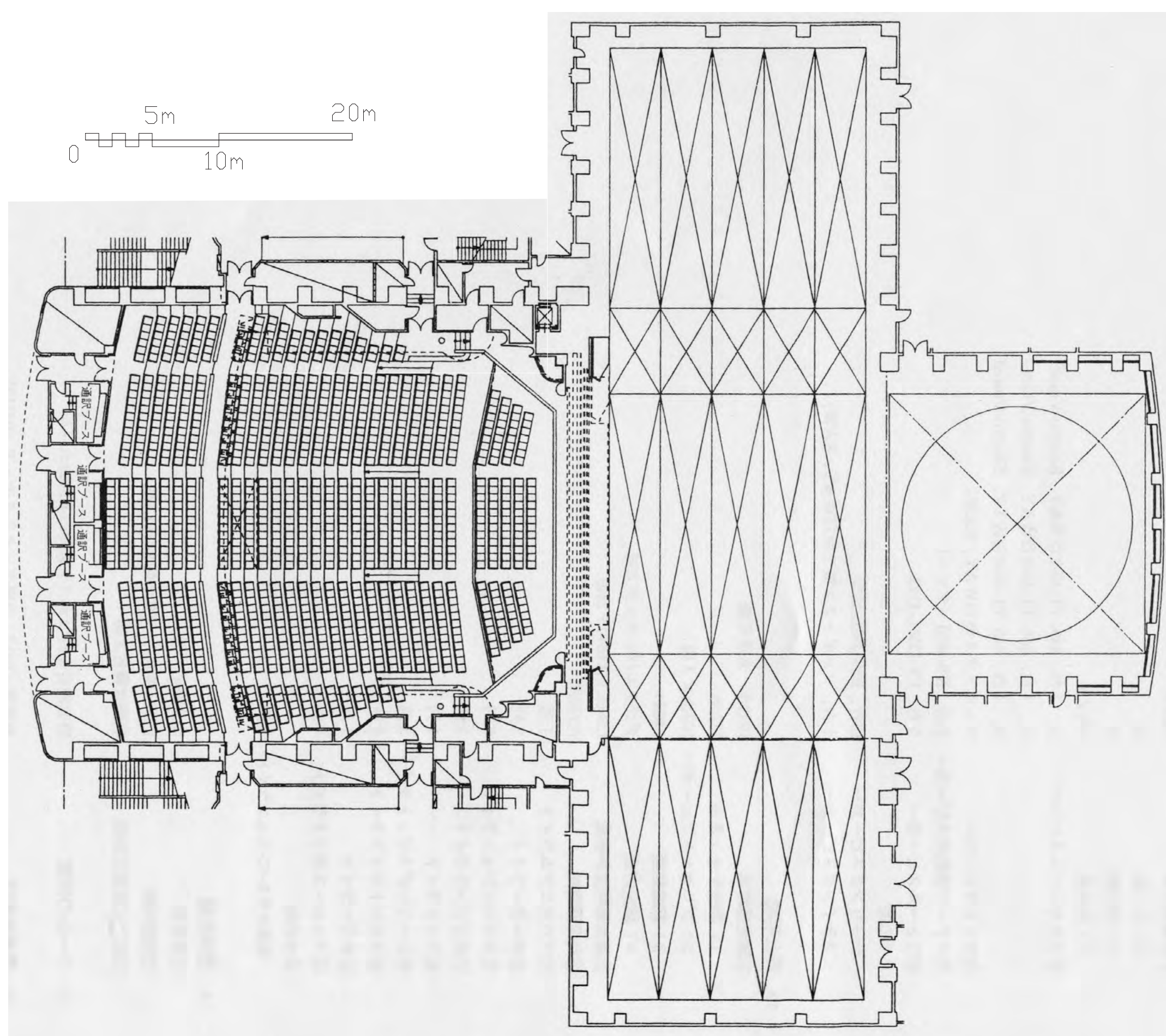
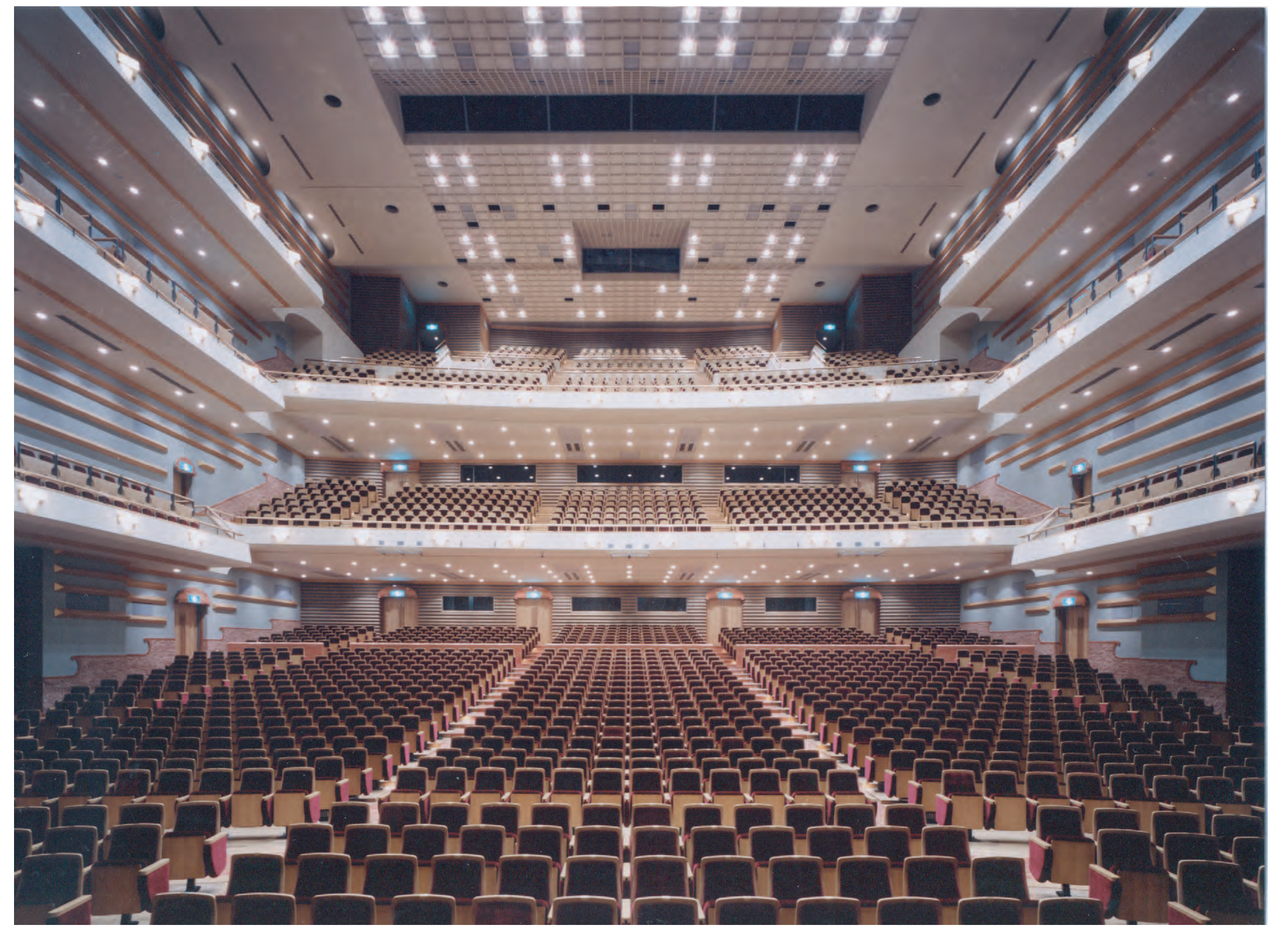
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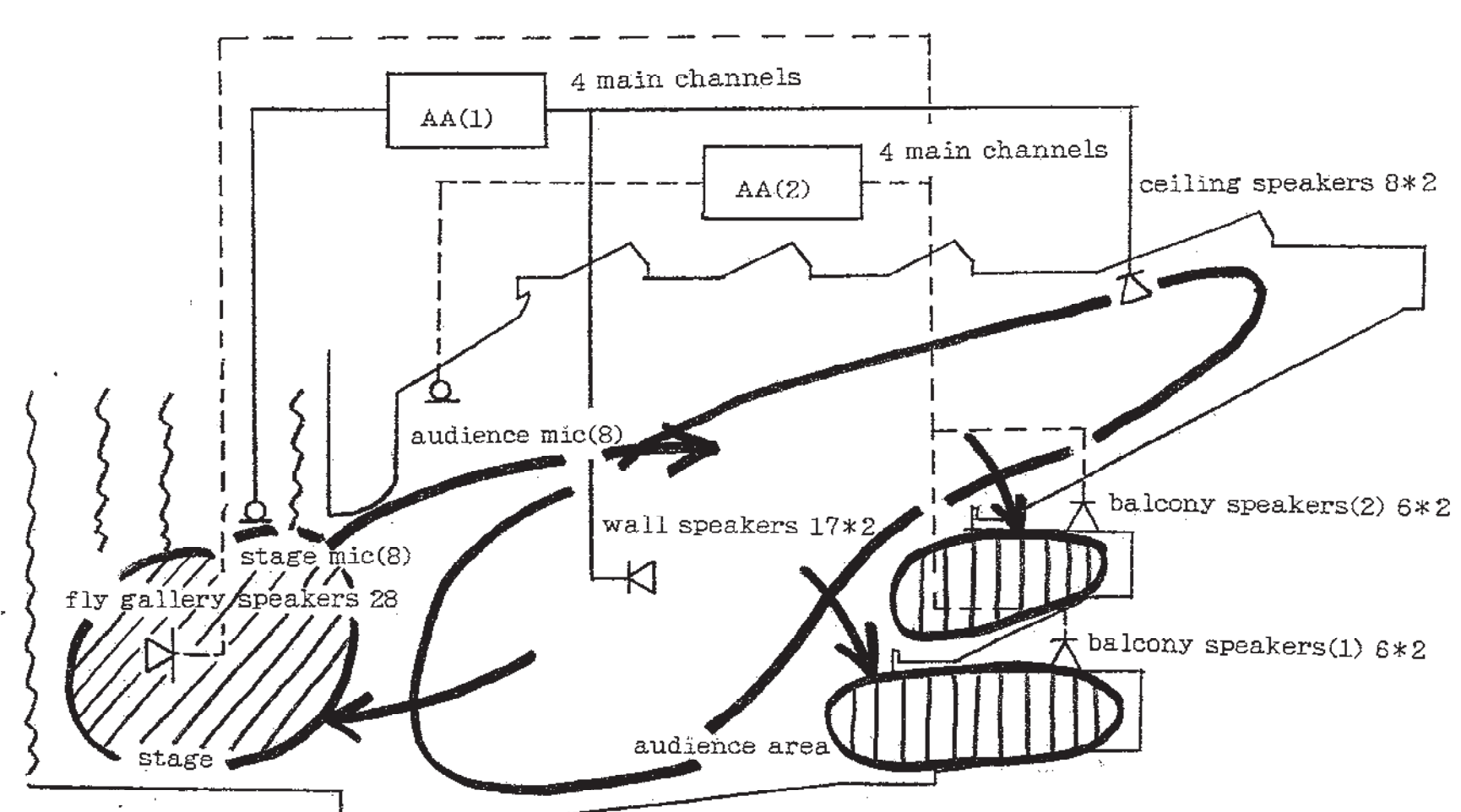


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LONGITUDINAL SECTION



MAIN FLOOR PLAN



Active Field Control Scheme

