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**Hypothesis of transformation to small auditorium of the existing gymnasium of the building complex of the Conservatory Licinio Refice of Frosinone**

by Laura Mazzola

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The work on this research takes cue from a tender emanated from the Conservatory “Licinio Refice” of Frosinone for the transformation of the gymnasium of the school complex in auditorium to service the school activity.

The proposal developed aims to address the entire project with a multidisciplinary approach, combining in a single solution to aesthetic preferences and technical solutions.



The work planned is part of a single intent of giving a new face to the area, although acting on different scales. There's been an attempt to improve the relationship between the intervention area, the city and its surroundings, to equip the Conservatory of adequate space for the performance of school activities and to widen the spaces for teaching.

The new design of the outside consists of a space more open towards the surrounding area, characterised by the green and the different levels which are determined by the landscape, creating significant gathering areas and still maintaining a filtering quality which was already there previously.

The proposal to increase the number of classrooms of the Conservatory is resolved by enclosing the porch of one of the school blocks with a continuous glass slab, creating a new enclosed space that unifies most of the classrooms to the auditorium, which represents the public display window.

The key point of the entire plan is represented by the auditorium. The expansion of the existing volume is justified by the need to obtain a technical internal volume required to achieve the acoustic characteristics and also the capacity requirements.



The lining of the hall is made up of modular panels in wood, a solution which allows to split the side walls of the room, creating niches and inclined planes. This choice is justified by the need to converge noise to break the parallelism between the walls, to direct the sound waves reflected in a homogeneous environment and to interrupt large and otherwise monotonous areas.

The roof was designed as a monolithic element, which rests on the walls of the room like the "lid of a box": a highly segmented cast concrete block, sufficiently heavy not to vibrate when struck by sound waves. The choices from which this element derives are a combination of the acoustic requirements of having a surface capable of spreading the sound produced through the fragmentation of this element as much as possible, and the architectonic choice to characterize the interior of the room and exterior view of the complex with a new element.



The ability to vary the acoustics of the room was achieved through the use of mechanized sound-absorbing curtains that can be unrolled to reduce the reverberation time of the room or remain hidden in special compartments concealed by panels of wood covering the walls of the room.

The objective of meeting the needs of the versatility of the space has been supported throughout the entire design phase by the checks on acoustic quality of the hall, carried out via a specific software.

The simulation was carried out through the use of the software Odeon 9.2, which on the basis of three-dimensional CAD models, reconstructs the sound field, assessing acoustics through objective parameters.

The apparent multiplicity of uses of the room requires that the design is aimed at identifying solutions to ensure good acoustics of the room, in each of the conditions laid out, allowing some variability of the characteristics of the room. To simulate the auditorium of Frosinone were analysed three possible scenarios: symphonic music, chamber music and speech, and consequently the indices to be investigated and the optimum values to which they refer are strictly dependent on the purpose analysed.

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