Redesigning venues for cultural activities in urban space: from multi-purpose to specific purpose halls

N. Barkas[1*], E. Artemi[1]
[1] Department of Architecture, School of Engineering, Democritus University of Thrace, Xanthi 67100, Greece

* Corresponding author: e-mail: nbarkas@arch.duth.gr, Tel +30 25410 79356, Fax: +30 25410 79350

Abstract

The proposed communication is part of the results of a three-year research project entitled "*Investigation, evaluation and re-utilization of venues for cultural activities in existing shells of the Municipality of Katerini*". The project aimed to investigate the actual or the optional functions of existing or unfinished cultural venues, within the boundaries of the Municipality of Katerini and to indicate the most suited function for each shell. The paper proposes a methodology for evaluating venues for cultural activities, in conjunction with the requirements and specifications of the relevant regulations. The evaluation criteria and the design parameters regarding the hall, the stage, the technical facilities and the public service areas, are listed. Furthermore, the infrastructure needed for ensuring the desired multi-functionality of the halls, as well as the required visual and acoustical comforts, are analyzed.
Keywords: cultural venue; multi-purpose hall; redesign conference hall; Katerini

1. INTRODUCTION

The city of *Katerini*, capital of the county *Pieria*, region of Central Macedonia, lies on lowland area between the *Pieria Mountains* and the gulf of *Thermaikos*. With a population of nearly 56.000 citizens (2011), Katerini recently acquired a modern hospital and a renovated railway station. Within a close distance of 68km from the city of Thessaloniki, and traversed by the main national *highway 1*, Katerini experiences contradictory dynamics, beneficial in terms of transportation, but on the other hand deterrent to its self development.

Traditionally, the region's economy is based on the cultivation of tobacco. The Balkan conflicts of the last 25 years significantly decreased tourism in the region. However, thanks to the organized seaside resorts, the antiquities of *Dion* and the proximity to the mount of *Olympus*, in recent years Katerini managed to gain remarkable tourist income. At the same time, the city experienced a rapid urban development, towards the available extensive surroundings.

The current paper is part of the results of a three-year research project entitled "Investigation, evaluation and re-utilization of venues for cultural activities in existing shells of the Municipality of Katerini" (2009-2012). At first, while organizing and planning the project, the Municipality of Katerini indicated the following existing venues, in order to investigate and estimate their actual or potential functional capabilities.

-A1, the Conference Hall on the ground level of the *Ekavi* Cultural Center, in Ekavi Park.

-A2, the Multi-purpose Hall on the first level of the *Ekavi* Cultural Center, in Ekavi Park.

-A3, the open-air amphitheater, in Ekavi Park.

-B, the events Hall at the *Katafygioton* Cultural Center

-C, the Multi-purpose Hall at the former *Multisectoral Lyceum*,

-D, the events Hall at the Municipal Conservatory.

Later, during the implementation of the project, the necessity of designing an optimal function, especially for the allegedly called "Multi-purpose Halls" (A1, A2, B, C), arose.

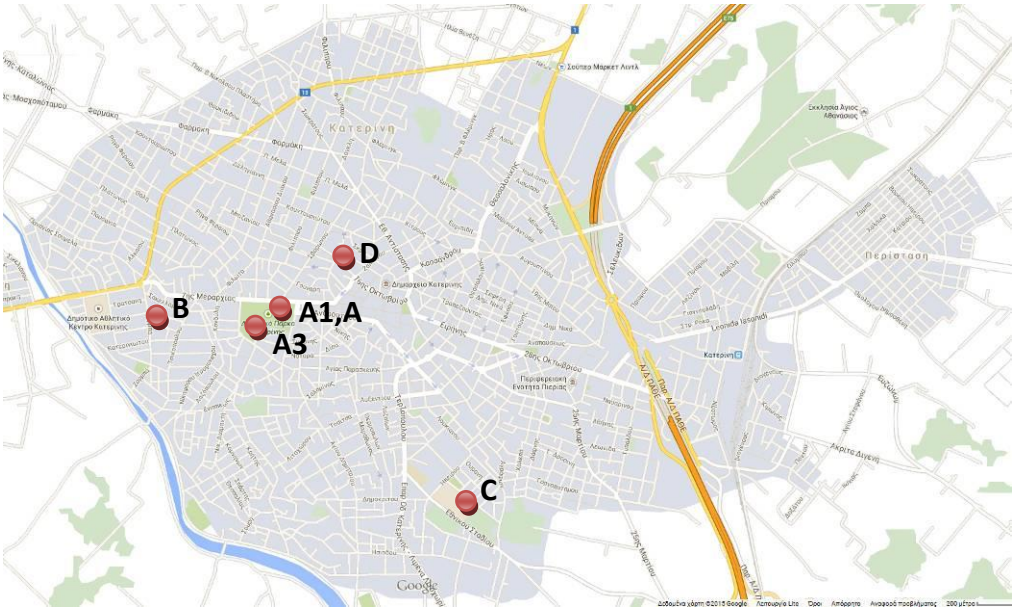

Figure 1. The location of the cultural venues in the city of Katerini

The *multi-purpose hall* constitutes the common choice for the organization of cultural activities in small or medium-sized regional cities or districts in metropolitan areas. It appeared in the early 20th century, as an experimental proposal of the European *avant-garde*, in the effort to create a *universal* venue for representations. In the `50s, it was adopted, for commercial reasons, in order to increase the actual beneficial operating time and expand of the halls' repertoire. Since the early `80s, the multi-purpose hall was established for organizational and economic reasons in Western Europe, as the most appropriate tool for the organization of public cultural infrastructure and the establishment of regional cultural networks. The expense of the construction and maintenance of an integrated multi-purpose hall is significantly higher, compared to an equivalent specialized hall, because of an overburdened building program, but also due to the maintenance of the multi-functional mechanisms. Yet, its main advantage is the ability to serve a variety of cultural activities in the same (and possibly unique) hall of a region [1, 2, 3].

Unfortunately, a simplistic policy and bad practices have led to the construction of halls allegedly called multi-purpose (with average level technical capabilities or even without any technical infrastructures). In times of economic crisis, the maintenance and modernization of the multi-functional mechanisms in multi-purpose halls is being jeopardized leading to a complete abandonment of the existing public cultural infrastructures. As an effort to reverse such an unpleasant development, in the phase of reorganizing and redesigning, it is preferable to adopt specific uses for each hall and create a network of cooperating cultural venues [1, 4, 5].

The methodology used for evaluating existing venues, examines a set of criteria that describe the functional capacities of the venues, in conjunction with the requirements needed for sufficiently hosting specific cultural purposes. The classification of the criteria's sufficiency is summarized on a table for each venue separately, on a scale: adequate (+), relatively adequate (X+), relatively inadequate (X-), inadequate (-). The evaluation criteria and the design parameters regarding each

venue are: the stage, the hall (the spectators' space), the technical facilities, the public service areas and the electromechanical installations [6, 7].

1.1. The Stage

The term *stage* refers to the useful playing area where a cultural activity takes place, including the areas that functionally support the specific activity (backstage areas, walkways, service areas for the performers and the personnel, storage and utility rooms). The playing area of the stage, depending on the type and size of the respective cultural production, is being evaluated according to its size, the technical competence that it serves and the visual - acoustical facilities that it ensures.

For instance, the playing area of a theater requires a min of 64m², the typical stage platform, referring to the stage tower needs a min of 100m², the stage for recital music concert requires a min of 12m², while the typical arrangement for a symphonic orchestra needs a min of 120-140m². The usable, visible stage area is being supported by equivalent, invisible backstage areas and facilities. Usually, the backstage of a theater covers an area 4 times bigger than the usable stage, while screenings have no need for background areas [1, 2, 6].

1.2. The Hall

The term *hall* refers mainly to the auditorium including the accesses (circulation-hallways, walkways, emergency routes, accessibility) and the public service areas (ticket office, foyer, cloakroom, and visitors' toilets).

A cinema hall, a conference hall or, in general, a hall for speech requires a volume proportion 2,8-4,3m³ per spectator, the necessary reverberation in concert halls requires 5,5-6,5m³ per spectator, while a hall for chorus 8-10m³ per spectator. According to the available volume and the purpose of the hall (speech, music or both), the distribution of the absorbing internal coating is being specified. The complexity of the issue increases in cases where acoustically distinctive purposes are combined, whether by reforming the hall (change of volume) or by rearranging the internal coatings-paneling (change of sound absorption) [3, 6]

The visual and acoustical comforts, plus the sound insulation, constitute the main evaluation criteria of the halls' competence. Visual comfort is defined by the visibility of the playing stage by part or the entire audience, as well as by the technical support rooms. Soundproofing is the primary concern of a hall's design, while the noise (external and internal) may ruin part of the useful audio signal. The Greek building regulation and international *noise criteria* (NC) are ranked according to the importance and purpose of the hall ($L_{eq,h,A}$ = 25 / 30dB [A]). The acoustic comfort of the spectators is combined (but not equivalent) with the visual comfort and the dissemination of the direct sound, the distribution of the early, positive sound reflections and the control of the hall's reverberation [8, 9].

The combined speech and music purposes (i.e. multi-purpose rooms) require readjusting of the reverberation (either by reforming the volume/capacity, or by changing the internal coatings-paneling). For example, low volume and large capacity (<3m³ / viewer) halls can not host concerts or recitals [3, 4, 5].

1.3. Technical support rooms – Personnel rooms - Secondary and storage spaces

They are a broad set of spaces that constitute the infrastructure of a stage and they practically define the adequacy and usage range of the venue.

A typical example is the opera or the dance theater, where the extent and the volume of those facilities occupy min 3 times the total space of the spectators' area and the scene. Another characteristic is that, in concert halls, although the need for secondary spaces is low, the

requirements for personnel service spaces (changing and tuning rooms) specify the venue's scope (local, hyper-local, or international). In small and medium size halls, the use of a combined technical support room (projection, sound support & reinforcement, lighting) is recommended. Also, in the case of international conferences, the facilities must accommodate permanent or portable translators' chambers (2 posts per language) [1, 3].

1.4. Public service areas

Unlike the service areas for the performers and the personnel, the service areas for the public are exposed (entrance hall, ticket office, foyer, cloakroom, refreshments canteen etc.). In general, these spaces exceed in size the area of a standard hall.

The dispersion of public service areas at multiple levels (yard, galleries, balconies) and space occupation of the building requirements at each level (staircases, elevators, disabled access, separated toilets, etc.) is crucial [3, 6].

1.5. Electromechanical Installations

Cultural venues, apart from the E/M installations of a typical building for cooling, heating, lighting, active fire protection, plumbing, drainage, need extra ventilation systems, special lighting systems and sound reinforcement systems. Their routing requires additional (invisible) internal hall volume, sufficient machinery space within the building and adequate anti-vibration isolation [1, 6, 7, 8].

2. THE CURRENT STATE OF THE RESEARCH HALLS

2.1 The Cultural Center in Ekavi park (A1, A2)

The park of Ekavi is located in the center of Katerini. It was created in the place of an Ottoman military camp (1913 - 1928) that initially covered an area of 80 acres. The park and the botanical garden were formed first (1952, 70 acres) and later, in the southern part, a school complex and an outdoor theater were constructed, while in the north-western part, the Cultural Center was built in the place of the municipal cafeteria.

To Cultural Center accommodates on the ground floor a conference center and a municipal refreshments bar and on the upper floor a children's library, a multi-purpose hall and spaces for the creative occupation of children.

In the Conference Center (A1), the current stage and backstage area cover a total area of 210m², but they remain unexploited, because of their complex layout, with fixed walls and typical levels. The useful stage area is only 46m² and is placed asymmetrical in relation to the rest of the hall, on a raised platform (+ 0,57m). The current layout of the stage can only host lectures and concerts with small musical-dancing ensembles; all other events can not substantially be represented.

The hall has two (2) main accesses (through the hallway serving the staircases of the building) and two (2) supplementary exits (without anteroom). The existing auditorium has a long and narrow shape (basic ratios of 1: 4.4: 8.05, area of about 310m²), the floor has a slight slope (<3%), while the clear height of the hall is limited (max 3,26m, volume 910m³), due to the hang of the roof beams. Currently the auditorium has about 360 fixed seats (ratio 0,86m2 & 2,5m3 per spectator).

At this time, the Conference Center in Ekavi constitutes the main conference hall of the city that hosts local and hyper-local cultural events, even though the hall is not suitable for representational events, due to the poor visual comfort and the small size of the stage platform. At the back of the hall there are technical support rooms with limited visibility. Although there is enough space behind

the stage for hosting changing rooms and auxiliary spaces, this is parceled and therefore of no use. Finally, the existing hallway has insufficient capacity, to be used as foyer and also has problematic access to the canteen, while the public wet areas are not adequately separated (by anteroom) from the hall.

As shown in the following summary table, the hall, in its current condition, is only suitable for medium scale conference purposes, with limited potential for improvements.

PURPOSE	*Hall/ Auditorium*	*Stage*	*Function Services*	*Public Services*	*Acoustic Correction*
Conferences	*X+*	+	+	*X-*	*X+*
Screenings	*X+*	-	-	*X-*	*X+*
Theater	-	-	-	-	-
Events	-	-	-	*X-*	-
Concerts	*X-*	*X-*	*X-*	-	-

The multi-purpose hall (A2) on the upper floor of the Cultural Center is equipped with a small stage platform (area 57m²), relatively raised (+ 0,63m) and only one changing room (15m²). The space for the audience has a wide rectangular shape (basic ratios of 1: 6,5: 3,4, area 275m²) and small height (2,90m), due to the hanging roof beams (0,68m). It has 155 fixed seats and limited visual comfort for representational events or screenings.

In the present period this hall hosts speech events and choral concerts of local and hyper-local interest. It has no entrance hall or technical support room, nor any autonomous public service areas.

PURPOSE	*Hall/ Auditorium*	*Stage*	*Function Services*	*Public Services*	*Acoustic Correction*
Conferences	*X+*	+	*X+*	*X-*	*X+*
Chorals	*X+*	*X+*	-	*X-*	*X-*

As shown in the table, the hall is only suitable for conference and choral purposes of small scale, with limited potential for improvements. In order to function as a multi-purpose hall (i.e. combined music and speech purpose), the application of double layer paneling of different sound absorption is required for this venue.

The effective management of the operational issues and the limited facilities of the Cultural Centre require serious modifications in the whole building:

-either by immersing the auditorium (increase of the height, slope and volume) in conjunction with the rearrangement of the stage areas (maintaining two halls- ground & upper level), or

-by integrating the overlying level into the ground hall (forming one hall)

To implement scenarios of such an extent, the current shell will remain in situ as an external outline, but the internal part of the building will be completely redesigned, reconstructed and statically reinforced.

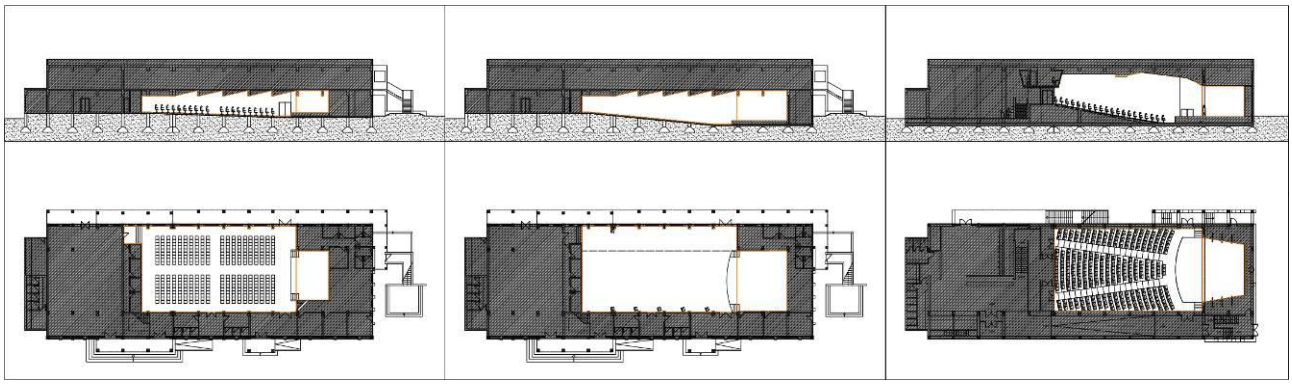

Figure 2. The Ekavi Cultural Center: research modification diagrams: present state, immersing the auditorium, integrating the overlying level (increase of the height, slope and volume), *(diploma thesis of Eleni Artemi, Department of Architectural Engineering, D.U.Th, 2009)*

2.2. Events Hall at the *Katafygioton* Cultural Center (B)

The Cultural Centre in the "Katafygioton" area is an unfinished building, which on the ground floor was designed to have a venue for music, dance and social events.

The auditorium has an autonomous recess (area 14m²), to be used as the stage area of the hall (conventional height 4,2m), which due to its size cannot practically serve any representational event. The stage platform could be combined with an extensive proscenium to obtain a surface (approximately 25m²) capable of hosting small ensembles, but without the potential of supporting the events with further infrastructure.

In the case of adopting a horizontal floor in the auditorium (seats in single level), the expected proscenium height will be around 90cm (to ensure visibility for all seated audience, for conferences, concerts or film screenings).

The hall has a main access through the central entrance of the building. In the intermediate space it is possible to arrange an independent entrance foyer (ticket office, cloakroom) and separated, closed hallway for the staircase/elevator of the building and for the public service facilities (foyer, canteen, visitors' toilets).

The auditorium extends in two levels (yard and perimeter gallery, of total height approximately 5,0m), with trapezoidal plan (total usable area of approximately 110m², main ratios 1: 1,9: 2,2). The gallery is located on the upper level, and follows the outline of the yard (in plan) and also hosts the technical support room. The capacity of the yard is 175 seats, while the gallery can additionally accommodate 30-40 seats. Considering the total available volume of the auditorium (approximately 750m³, ratio 3,6m³ per spectator) and the functionality of the stage, the hall can host only speech uses (or with sound reinforcement system) and thanks to the single horizontal level of the floor design and the mobility of the seats, it can also host festive events (dances, banquets, etc.).

PURPOSE	***Hall/ Auditorium***	***Stage***	***Function Services***	***Public Services***	***Acoustic Correction***
Conferences	***X+***	+	***X+***	+	***X+***
Concerts	***X+***	***X+***	***X-***	+	***X+***

As shown on the above summary table, the hall can adequately host social and music - dance events and small projections, but it is not possible to cover the requirements for representational or music events of hyper-local range.

2.3. Multi-Purpose Hall of the former *Multisectoral Lyceum* (C)

The hall is a separate wing of a large school complex in the region of the National Stadium of Katerini. Originally it was intended to serve only educational activities, but later, thanks to its size and the proximity to a nearby parking area, it is used for musical and representational events of local and hyper-local range.

The building ward has a rectangular shape and is strictly limited on three sides (sides and stage). The current stage platform (playing area 80m², backstage areas 90m² and forestage height + 1,09m) has a narrow proscenium with a stage curtain (portal height 4,13m, without stage tower and additionally, an invisible zone of 0,55m height for lighting rack). With the existing layout, the stage cannot achieve the requirements for an integrated theatrical performance.

The main entrance to the hall is through the educational institution, while there is a secondary access on the back for emergencies leading to the courtyard of the complex. The space has a square shape (basic ratio of 1: 3.6: 3.5, total area of about 400m²) and horizontal floor (clear height 5,25m, beam's hang 0,4m) with a large number of about 350 removable seats. The available volume is 2250m³ (original ratio 5,2m³ per spectator).

The internal coating /lay-out of the hall refers to a simple sports hall design. With the existing layout, the visual comfort is limited to approximately 40% of the capacity for representational events, 60% of the capacity for film screenings and about 75% of the capacity for concerts. Additionally, the venue has no entrance hall or anterooms, nor soundproof protection.

In order to cover speech events, a massive reduction of the reverberation time is needed, while for hosting music events an acoustic correction to a specific frequency range is sufficient. Additionally, the venue does not have technical services or separated autonomous spaces for the public and the artists. At its present deficient condition, the venue cannot accommodate hyper-local events.

PURPOSE	***Hall/ Auditorium***	***Stage***	***Function Services***	***Public Services***	***Acoustic Correction***
Conferences	***X-***	**+**	***X+***	***X-***	***X-***
Screenings	***X-***	***X+***	***X-***	***X-***	***X-***
Theater	**-**	**-**	**-**	**-**	**-**
Events	***X-***	**+**	***X-***	***X-***	***X-***
Concerts	***X-***	**+**	***X-***	***X-***	**-**

As shown at the summary table, the multi-purpose planning requires the installation of a stepped floor (permanent or removable for combining sporting and social events). While, the variable acoustic design (i.e. combined music and speech purpose) requires the application of double layer paneling of different sound absorption.

3. PROPOSALS FOR THE OPTIONAL AND COMBINED RE-USE OF THE HALLS

As recorded in the previous discussion, the available venues for cultural activities in the municipality of Katerini can not be considered as multi-purpose halls, due to their moderate efficiency and poor flexibility. The classification of their functional capabilities in relation to a specific use is shown in the following table.

PURPOSE	A1	A2	B	C
Conferences	*X*+	*X*+	*χ*+	*X*+
Screenings	*X*-	*X*+	*X*+	*X*+
Theater	-	-	-	-
Events	*X*-	*X*-	*X*+	*X*+
Concerts	-	+	*X*+	*X*+

It is obvious that all halls demonstrate a unilateral adequacy for conferences and social events, due to the reduced operational requirements for those specific purposes. At the same time, film screening operation is very limited, unless sufficient technical infrastructure and areas for public services are provided. Theater performances are almost impossible under these conditions (lack of adequate stage platform and stage tower). In order to ensure an appropriate theater hall, brave modifications are required to each and every one of the existing shells. The organization of a relatively flexible network of music halls (for recitals and orchestral ensembles) seems more feasible. However, the transformation of a concert hall to a multi-purpose hall is very expensive requiring continuous changes of the layout and of the acoustic shell. Therefore, venues suitable to respond to the requirements of a music hall should be deprived of their original (social or athletic) purposes.

Based on the above, the study proposed three (3) alternative scenarios for the re-use of the available venues (minimal modifications, maximum functional flexibility, specialized primary purpose for each venue). The final decision of the Municipality of Katerini, followed by a set of variations, concluded to the adoption of a specific purpose for each hall:

-in the Cultural Center of the Ekavi park, the conversion of the building into a theatre (maintaining the existing shell) was concluded. An auditorium is created with stage tower, service areas for the public and the personnel, along with the potential of an additional hall,

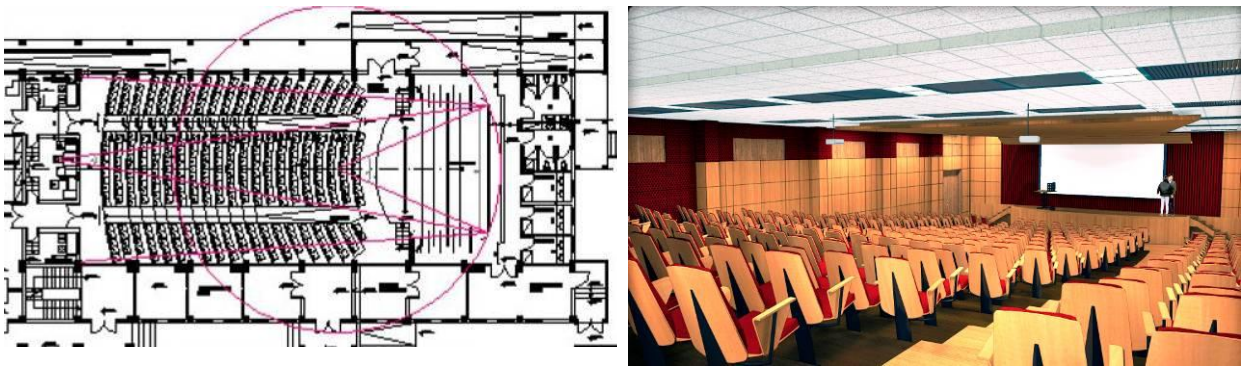

Figure 3. The Ekavi Cultural Center: proposal for re-use *(diploma thesis of Katerina Katsanika, Georgia Ntouroupi, Department of Architectural Engineering, D.U.Th, 2012)*

- the Events Hall at the *Katafygioton* Cultural Center was decided to maintain the social - festive purposes, and, at the same time, to host music recitals or small musical ensembles,

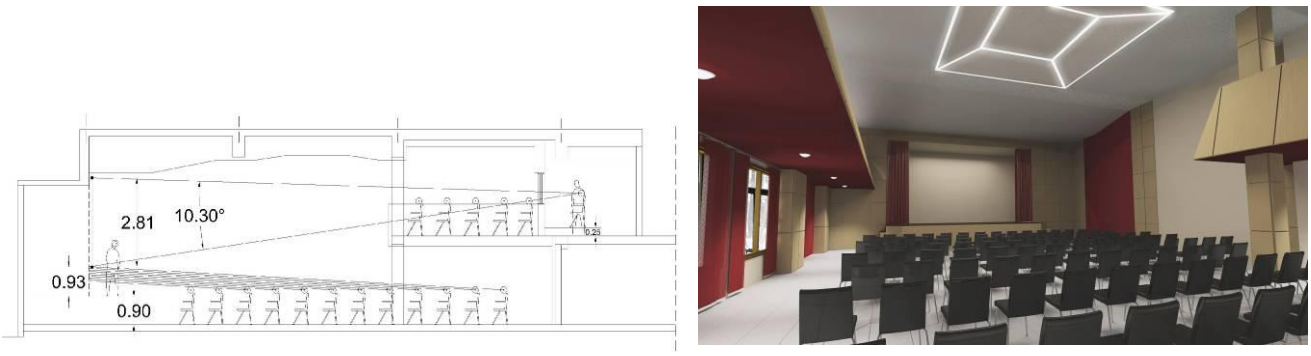

Figure 4. The Events Hall at the Katafygioton Cultural Center: proposal for re-use *(R. Deligiannidou –N. Barkas)*

-the Hall in the former *Multisectoral Lyceum* was concluded to become a concert hall with fixed stepping floor, extended to the back yard, incorporating bordering spaces of the school complex to provide accesses, anterooms, public and artists' service areas.

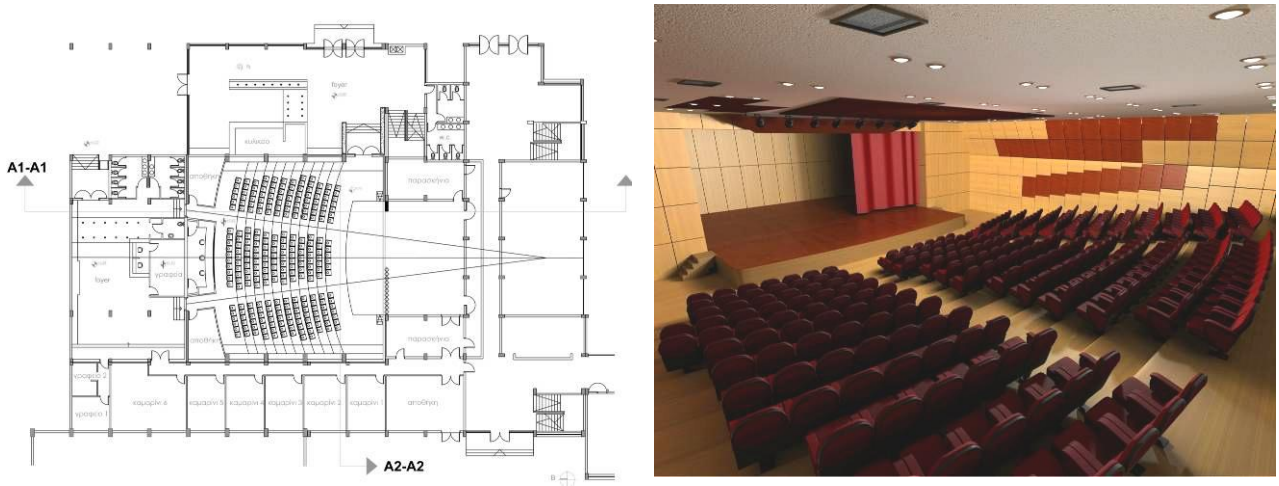

Figure 5. The Multi-purpose Hall in the former Multisectoral Lyceum: proposal for re-use (*diploma thesis N. Zogkoudis Department of Architectural Engineering, D.U.Th, 2011*)

4. THE IDENTITY OF THE RESEARCH PROJECT

Academic responsible: Nikos Barkas

Research team: Eleni Artemi, Rika Deligiannidou, Nikos Zogkoudis, Katerina Katsanika, Georgia Ntouroupi, Yannis Tombakidis. All members of the research team graduated from the Department of Architectural Engineering of the D.U.Th.

The research project was financed by the Municipality of the city of Katerini (2009 – 2012) and was managed by the Research Committee of the Democritus University of Thrace (D.U.Th).

References

1. Izenour, G. C., 1988. *Theater Technology*. New York: Mc Graw-Hill.
2. Athanasopoulos, Ch., 1983. *Contemporary Theatre: Evaluation and Design*. New York: John Wiley and Sons, Wiley Interscience Publications.
3. Barkas, N., 2012. *Acoustic Design* (course notes). https://eclass.duth.gr/courses/ TMD101/ (accessed Avril, 2015).
4. Doelle, L.L., 1972. *Environmental acoustics*. New York: Mc Graw-Hill.

5. Lord, P., & Templeton, D., 1986.*The architecture of sound*. London: The Architectural Press Ltd.
6. Barkas, N., 2000. Organization of venues for cultural activities in historic buildings. In N. K. Hatzitrifon (ed). *Appropriate interventions for the safeguarding of monuments and historical buildings* (pp. 399-410). Thessaloniki: Technical Chamber of Greece.
7. Vlachos, Y., & Barkas, N. (to be published). Re-use of industrial shells for cultural activities: recasting the warehouses in the port of Thessaloniki. In the *Proceedings of 5th Conference of the TICCIH*, Volos, 2007
8. Lehmann, R., 1977. *L'acoustique des bâtiments*. Paris: P.U.F.
9. *Greek Building Regulation*, Article 12 (n 3046/ 304 - 30.1/3.2.1989)