CONTRIBUTION TO RESEARCH, PROTECTION AND REVITALIZATION OF INDUSTRIAL HERITAGE OF BELGRADE

Marko Nikolić

Summary: The education process for the students of architecture, the future builders, provides possibilities to comprehend the problems of the city industrial heritage protection, its historical and urban context, its genesis and cultural and architectural values. The paper will present search for possibilities of protecting the “Pantelić” Foundry in Belgrade, its presentation and inclusion in the modern way of life. It was a part of master academic program at the Faculty of Architecture University of Belgrade. Through a designing process the students put an accent on comprehensive investigations of its entire history: various changes in its structure, from the middle of 19th century to the present day. The goal was to define a sustainable solution that would protect all the development stages of the complex. On the other hand, the idea was to make the complex active and useful once again, and to reintegrate it in its immediate surroundings. Consequently, the students proposed a number of modern cultural, educational and artistic uses of the complex, which would be in correlation with its character and significance, thus providing a way of achieving an active future.

Резиме: Процес образовања за студенте архитектуре, будуће градитеље, омогућава разумевање проблема заштите индустријског наслеђа, његовог историјског и урбаног контекста, његове генезе културних и историјских вредности. Овај рад приказује испитивање могућности за заштиту ливнице „Пантелић” у Београду, њену презентацију и укључивање у савремени живот. То је био део наставног програма на мастер академским студијама архитектуре Архитектонског факултета Универзитета у Београду. Студенти су кроз своје пројекте ставили нагласак на детаљно истраживање целокупне историје Ливнице, на разне промене у њеној структури од средине 19. века до данас. Циљ је био да се дефинише одрживо решење које би заштитило све развојне фазе комплекса, а са друге стране да се тај комплекс опет активира и учини корисним, као и да се интегрише у своју непосредну околину. Студенти су предложили низ модерних културних, образовних и уметничких садржаја, који би били у складу са карактером комплекса и његовим значајем, као један од начина реализације његове активне будућности.

1 Marko Nikolić, PhD, Assistant Professor, University of Belgrade, Faculty of Architecture, Bulevar kralja Aleksandra, 73/II, Belgrade, Serbia, tel: +381 64 25 36 200, e-mail: marko@arh.bg.ac.rs
Key words: Industrial heritage, protection, reactivation, authenticity, integrity, education

1. INTRODUCTION

In contrast to the entire architectural heritage, which has lasted for hundreds, even thousands of years, the observation scope of industrial heritage is narrowed down to several centuries, even decades. Two factors have influenced this: 1. Industry has started developing only a few hundreds years ago with an intensive advancement in the second half of the 18th century after the so called "industrial revolution" in England, and especially in the last several decades, following progressive and ever quicker development of new technologies in almost all spheres of human activities and 2. For its own features, industry itself is self-destructive, i.e. in accordance with the new technologies and new methods of work, it continually innovates processes and removes, changes and even destroys current production assets and infrastructure, including the facilities as well as their immediate surroundings. [1] Nevertheless, it is clear there exists a general social interest to protect this time limited and specific type of heritage and preserve it for future generations as a testimony to technological development and technical culture. This interest has been recognized in the whole world and significant measures have been implemented in recent years.

2. METHODOLOGY OF WORK IN THE ELECTIVE COURSE

In numerous conventions and charters on the protection and revitalization of cultural heritage, there are notable

Кључне речи: индустријско наслеђе, заштита, ревитализација, аутентичност, интегритет, образовање

1. УВОД

За разлику од укупног градитељског наслеђа, које се везује за стотине, па и хиљаде година, хоризонт посматрања индустријског наслеђа је сужен на неколико векова, па и на десetine година. На то утичу две чинионице: 1. Индустрија је почела да се развија пре само неколико стотина година, са интензивним успоном у другој половини 18. века после тзв. „индустријске револуције“ у Енглеској, а посебно у последњих неколико десетина година, пратећи прогресивни и све убрзанији развој нових технологија у скоро свим подручјима људске делатности; и 2. Индустрија је сама по себи, због својих својстава, „самоуништавајућа“, односно у складу са новим технологијама и новим методама рада стално врши иновације процеса и одстрањивање, промене, па и уништавање постојећих производних средстава и инфраструктуре, укључујући и грађевине, као и непосредно окружење. [1]. Али, и поред тога, јасно је да постоји општи друштвени интерес да се овај временски ограничен и специфичан облик баштине заштити, као сведок развоја технологија и техничке културе, сачува за будуће генерације. Тај интерес је схваћен у целом свету и на томе се последњих година предузимају озбиљне мере.

2. МЕТОДОЛОГИЈА РАДА НА ИЗБОРНОМ ПРЕДМЕТУ

У бројним конвенцијама и повећама о заштити и ревитализацији кул-
recommendations in which it has been emphasized that for the work on the protection of cultural heritage, professionals with a specific knowledge of methodological, theoretical and historical aspects of these complex issues should be educated on university level. [2] This is the case with the convention on the protection of industrial heritage. [3] Following these recommendations, particular topics related to the revitalization and presentation of various types of architectural heritage have been explored for several years on the master studies of the Faculty of Architecture of the University of Belgrade. [4] A course named History and theory 1 – Visual Culture in the Architectural Theory and Practice, whose head is Assistant Professor Marko Nikolić, PhD was realized during the school year 2017/2018, in the fall semester, within the course in the first year of master studies of architecture, i.e. in the forth year of integrated academic studies of architecture at the Faculty of Architecture of the University of Belgrade. This year, the course has dealt with the topic of industrial heritage of Belgrade through the study of “Pantelić” Foundry in Zemun and the possibilities of its protection, revitalization and presentation. This is primarily a continuation of the study of the industrial heritage of Belgrade within the framework of teaching process. In the previous years this has been fostered by efforts of some professionals from the Cultural Heritage Preservation Institute of Belgrade. They suggested this type of architectural heritage should also be represented in particular topics already explored on master studies of architecture of this faculty in the field of research and protection of architectural heritage. The goal of the course was to identify certain values of industrial heritage of Belgrade, as well as to define this type of heritage to students through an actual example, so that they would improve and enrich their knowledge and approaches to preservation of architect-
tural heritage as well as their contemporary design in protected complexes with proposals of revitalization and presentation of "Pantelić" Foundry. During one-semester course, which consisted of lectures and assignments, students were introduced to: a contemporary methodological approach to research and evaluation of industrial heritage both in the world and in Belgrade itself; problems and methods of definition of potential and possibilities of regeneration of industrial heritage in accordance with contemporary needs; comparative analyses of advantages and disadvantages of various possibilities and approaches to protection and presentation both in our country and in the world etc. Within the first phase of course work, students familiarized themselves with more significant examples of industrial architecture in the world and in Belgrade through literature and Internet resources, field work and data analysis, for which they provided interpretation of their cultural-historical, architectural, scientific and other values as well as previous efforts of their protection. After that, students focused on research and collection of data on the example set to be explored - "Pantelić" Foundry in Zemun. Students independently researched and collected data from the "Catalogue of immovable cultural property in the territory of the city of Belgrade" available on the website of the Cultural Heritage Preservation Institute of Belgrade, [5] as well as from literature, on the basis of which they formed their own attitude and ideas. After the collection of basic data on historical and architectural development of the complex and recording present state, students presented the results of their research in the form of historical, urban and architectural analysis of the area and the facility itself. After synchronization of attitudes and results of research, work on preparation of proposal for contemporary interventions
followed, i.e. on defining the character of future design and presentation of the foundry, as well as on the revival of the immediate surroundings. Students researched the possibilities and formed individual proposals of the future revitalization and presentation of the Foundry.

3. ANALYSIS OF CULTURAL-HISTORICAL VALUES OF “PANTELIĆ” FOUNDRY AND ITS SURROUNDINGS

Pantelić Foundry is one of the oldest surviving industrial technical heritage sites in the Belgrade area. It is situated in the heart of cultural and historical spatial ensemble Old downtown of Zemun, at the corner of Gajeva and Dositejeva Streets. At one time, it was renowned because of technologies and tools applied in the manufacture of bells and clocks, not just in Zemun and its vicinity, but in the territory of Austro-Hungarian Monarchy. Even after 150 years, this facility has a huge significance for architectural practice, since it testifies to the industrial development and rise of crafts both in Zemun and in whole Belgrade. [6]
downtown of Zemun was formed on the foundations of Roman Taurunum [7], and since XII century it was known as Zemlen. In XVIII century, it developed into a town of orthogonal street matrix, in the shape of an irregular square. During that period, a great number of educational, religious, military, residential, commercial and craft facilities were built, of various stylistic influence and building techniques. The old downtown of Zemun has 59 streets, six squares and over 900 structures, many of which have a status of cultural property of great value [8]. The oldest buildings include: White Bear tavern (kafana) (status of tentative protection), Church of St. Nicholas, (cultural property) [9], Karamata's family House (status of cultural property of great value). [10] It is important to mention Afrodita Bialo's House (status of cultural property) [11], Customs Office Building (status of cultural property) [12] and Zemun Fortress, Gardoš (status of cultural property) [13] which are situated in the immediate vicinity of the Foundry. There are fortress ramparts from the Austro-Hungarian period (17-18th century) on a dominantly loess hillock above the Danube Gardoš Hill, which is situated in the immediate vicinity of the Foundry. A suitable position, flood protection, proximity of important commercial, inland and waterways were the reason for the settlement foundation at this very place ever since the ancient period. It is important to emphasize that a large amount of archeological materials from Hallstatt and Bronze Age has been recovered on this site which testifies to Gardoš being populated even in prehistoric times.
"Pantelić" Foundry was founded in 1854 by Đorđe Pantelić and it was situated in a small worn-down ground-floor house. In the beginning, the facility was used as a locksmith workshop for manufacturing and repairing small household items. Until the mid 1970s the facility held the original manufacturing craft moulds and processes which, in addition to being tangible remains, carry a special meaning, and the Foundry itself represented a place where numerous generations of young craftsmen matured. A detailed reconstruction of the facility was carried out in 1926 by a Zemun builder Josif Marks. The Foundry had an irregular ground floor, and the layout of the premises depended on manufacturing process taking place inside it for years. In the beginning, the facility was used as a humble locksmith workshop, but in time, and with extreme efforts of the Pantelić family who had owned it for three generations, it became specialized business for bell casting and manufacturing tower clocks. People still recognize it as "Pantelić" Foundry but its full name is "Bell casting foundry and tower clock manufacturer". With the development of casting process and programme, growth and wider range of products as well as expansion of architectural surroundings were facilitated. The workshop complex has been preserved to this day, and it encompasses a large one storey facility.
of irregular ground floor where entire equipment and inventory of blacksmith and locksmith workshops is kept, and where facilities of the old and new foundry, warehouse and offices are located. The site also encompasses grounds filled with machines, equipment, tools and numerous finished products of former manufacturing section. Although it was considered to be one of the most famous establishments of this type both in the territory of Belgrade and within borders of Austro-Hungarian Empire, today this facility is decrepit and left to oblivion. The last conservatory works were carried out from 1973-1979, and damp repair works in 2006. After this, this extraordinary museum of crafts, a guardian of development of crafts and technical culture, has been completely neglected, although it has had a status of cultural property of great value since 1979. [14]

4. POSSIBILITIES OF PROTECTION, REVITALIZATION AND PRESENTATION OF “PANTELIĆ” FOUNDRY – ACHIEVED RESULTS

Forgotten industrial facilities represent rich grounds for the development of various activities which can improve the society itself. Not only for its position, but also for its architectural assets, “Pantelić” foundry serves as a suitable place for holding events such as cultural and artistic affairs. This ground floor facility, set at the heart of old Zemun, offers a great basis for development of diverse activities which would again draw attention to this unrightfully neglected monument of industrial heritage. It is our duty to select carefully activities which would again breathe life into this guardian of technical development of Belgrade. Architectural value of this facility is undeniable and invaluable, since it reflects the mark of a certain time and era, which is significant not only for the development of the old downtown of
The main purpose of the Foundry revitalization and presentation proposal was to find a balance between the old and new. Ground floor is adapted to the future exhibition function of the facility, taking into account the tendency to preserve, as much as it possible, the authenticity and ambience of former complex. Newly designed area is modern, flexible, adapted for different artistic setups. In addition to the exhibition area, the facility has been added a multimedia area designated for organization of various artistic activities, such as exhibitions or workshops, and an area for the organization of various musical and theatrical events. A small counter has been established for the sale of souvenirs, which is an integral part of the facility. The starting idea of all students was to revive the area of “Pantelić” foundry in accordance with contemporary needs, but also to present in an adequate manner the historical development and the functions the facility had had through the history. In this sense, in their proposals, students strove for preservation of authenticity and integrity of the entire area, and for an adequate presentation of its valuable tangible and intangible elements. They aimed at keeping constitutional cultural-artistic character of the complex through its reactivation, new functions and amenities, various exhibition areas, art workshops and more attractive, especially for younger users who would create and have fun there, thus enabling financing of activities and sustainability of a new function.

4.1. Proposal of students Ana Milenkovic and Dušica Pašić

The main purpose of the Foundry revitalization and presentation proposal was to find a balance between the old and new. Ground floor is adapted to the future exhibition function of the facility, taking into account the tendency to preserve, as much as it possible, the authenticity and ambience of former complex. Newly designed area is modern, flexible, adapted for different artistic setups. In addition to the exhibition area, the facility has been added a multimedia area designated for organization of various artistic activities, such as exhibitions or workshops, and an area for the organization of various musical and theatrical events. A small counter has been established for the sale of souvenirs, which is an integral part of the facility. The starting idea of all students was to revive the area of “Pantelić” foundry in accordance with contemporary needs, but also to present in an adequate manner the historical development and the functions the facility had had through the history. In this sense, in their proposals, students strove for preservation of authenticity and integrity of the entire area, and for an adequate presentation of its valuable tangible and intangible elements. They aimed at keeping constitutional cultural-artistic character of the complex through its reactivation, new functions and amenities, various exhibition areas, art workshops and more attractive, especially for younger users who would create and have fun there, thus enabling financing of activities and sustainability of a new function.
been designed to accommodate basic catering demands on occasions of various cultural-art events. Within the facility, there are also a small souvenir shop, an info-desk and a workshop which produces unique brand watches whose sale should partially finance maintenance of this new cultural centre. The facility has a necessary administrative and technical area, then a balcony which also could be used as a place where various events are organized. The idea is that, in addition to organizing exhibitions, the center also deals with the organization of a large number of cultural events, dialogues, film screenings, or various artistic activities at numerous levels, and that historical information crucial for the development of the city itself is easily read.

Figure 3 - Proposal for revitalization and presentation of "Pantelić" foundry of students A. Milenković and D. Pašić, 2017.

The basic idea is to preserve completely both the existing roof structure and outer façade, which allows attainment of a realistic level of ambience. The preservation of casting furnaces and chimneys embodying authenticity of the entire facility is envisaged in addition to preserving the facades and elements of the structure. The area is divided by light partition walls and glass panels, which ensure the ambience is preserved, and the visitor is provided with easily read former area organization. In order to further accentuate and expose the basic idea to keep completely both the existing roof structure and outer façade, which allows attainment of a realistic level of ambience. The preservation of casting furnaces and chimneys embodying authenticity of the entire facility is envisaged in addition to preserving the facades and elements of the structure. The area is divided by light partition walls and glass panels, which ensure the ambience is preserved, and the visitor is provided with easily read former area organization. In order to further accentuate and expose
construction elements of the facility, but also to highlight multimedia area, which would in turn contribute to the understanding of old-new combination, a glass cubus was implemented into the Foundry. The glass cubus is supported by a steel structure, while on the outside it is covered with steel mesh. This addition represents the most interesting part of the facility which conveys the combination of the new and the old by its subtle and delicate appearance thus providing visitors with a unique visual experience. Natural materials such as concrete, glass and metal have been used in the interior in order not to interfere with the identity of the existing structure. The use of natural light is also accentuated which is enabled by implementation of the glass cubus. Technical and scientific values, which are rather important in this type of facility, are emphasized by preservation and presentation of casting furnaces, as well as of certain exhibits which were manufactured in the Foundry (bells, clocks, etc.) While conceptualizing facades, the plan was not only to merely "decorate" the exterior, but the goal was to esthetically improve front facades of this industrial facility which would enhance visual experience of a visitor and further promote the image of the whole site. It was achieved by implementation of the glass cubus which is lined with galvanized steel wire. With the use of this light and flexible mesh material, a great number of craft works was eliminated thus providing an adequate and inexpensive protection of the glass-steel structure, while the material itself is reminiscent of former casting processes and used raw materials. Small holes in the mesh provide inflow of indispensable day light into the area of media hall, while outside they create an interesting shadow and light play. The façade itself is completely preserved, so it has a great estetic value for rich plastic it possesses. In the proposal, it was treated with dark colours (different shades of grey in
The idea for revitalization of the facility by means of new spatial organization, originated in the old one, and is in accordance with the facility repurpose. Contemporary attitude towards the former manufacturing surroundings is reflected in the creation of an area where visitors would be introduced to the history of the Foundry through interactive workshops with authentic tools, and at the same time they could enjoy a pleasant, historically inspired ambience of the newly added café. The area is dominated by circular movement, which facilitates easier viewing of the exhibits connected to the history of the Foundry or product display from the workshop itself.

The café takes up two floors, where added floor is designed in a contemporary manner, by using glass and sheet metal in order to clearly differentiate the new from the existing. Sheet metal patina allows for the café to integrate itself into the authentic ambience of the Foundry, and the glass to create a homogeneous relations between the inner and the outer.

Distinctive character has been preserved by a complete retention, and even highlighting the elements of the roof structure inside the interior, with minimal treatment of floors and walls for the purpose of visual opening of the area.

Duality (old/new; open/closed), as an approach to the renewal, allows the former Foundry to regain the role of Zemun benchmark, but also the role of a new centre for quality time spending.
Figure 4 - Proposal for revitalization and presentation of "Pantelić" foundry of students T. Tamburić and K. Terzić, 2017.

4.3. Proposal of students Katarina Dimitrijević and Aleksandra Živković

Taking into account the preservation of original architecture of the facility, as well as the presentation of its previous purpose, revitalization proposal in this work was governed by the idea of installing a distinct exhibition area where visitors would have an opportunity to see products used to be made in the foundry. The thing differentiating this area is the existence of a balloon-like structure, which visitors would go through, while the exhibits would be placed outside the balloon around them. The particularity of this kind of exhibition organization is the very interchange of positions of exhibits and users, while their roles remain the same. This unique approach provides visitors with an opportunity to see the exhibiton in an unexpected manner, which is an interesting addition to the visit. The structure is divided into two parts at the end: café area - for adults; and for children it continues in the shape of a slide in the garden area, which then returns into the facility to the area of playground with balls. The facility structure remains mainly unchanged, apart from the newly added element in the interior which is a transparent balloon consisting of curved glass panels, carried by a steel structure of

Специфични карактер је очуван и потпуним задржавањем, па чак и истицањем елемената кровне кон-струкције у ентеријеру, уз минималну обраду подова и зидова у циљу визуелног отварања простора. Двојакост (старо/ново, отворено/зат-ворено), као начин приступа обнови, чини да некадашња Ливница врати улогу земунског репера, али и новог центра за квалитетно провођење времена.

Слика 4 - Предлог ревитализације и презентације Ливнице „Пантелић" студенткиња Т. Тамбурић и К. Терзић, 2017.

4.3. Предлог студенткиња Катарине Димитријевић и Александре Живковић

У предлогу ревитализације овог рада, а водећи рачуна о очувању оригиналне архитектуре објекта, као и презентације његове претходне намене, водило се идејом постављања специфичног изложбеног простора у коме би посетиоци имали прилику да виде производе који су некад настајали у Ливници. Оно по чему се овај простор издаја, јесте постојање структуре која подсећа на балон, кроз коги би се посетиоци кретали, док би се екс- понати налазили изван балона око њих. Посебност овакве организације изложбе јесте управо замена пози-ција експоната и корисника, док њихове улоге, пак, остају исте. Овакав оригиналан приступ пружа посетиоцима прилику да сагледају изложбу
connected frames. All values have been appropriately retained by preservation of elements personifying the quality of the facility and by unexpected and original interior design, which restore the foundry to its prominence through application of contemporary principles of revival.

Figure 5 - Proposal for revitalization and presentation of "Pantelić" foundry of students K. Dimitrijević and A. Živković, 2017.

4.4. Proposal of students Jovana Erdeljan and Nevena Đurić

The starting point in the proposal of revitalization of the former foundry relates to the adaptation of its areas, with as much preservation of structure, modelling, as well as tangible and intangible heritage. Former manufacturing area would become exhibition-sale area of educational character, by introduction of a smaller conference hall, and the hall for lecture and exhibition-related film screenings. Workshop and interactive lectures would be organized in the added annex. This new structure would create caskade platform and canopy for performances of domestic artists and designers as well as promotion of their works. At the same time, it would provide a new ambience dynamic with full retention of its authenticity, slanting above the existing roof. The annex

на неочекиван начин, што је додатна занимљивост посете. Структура се на крају дели у два дела: за одрасле - кафе простор, а за децу - наставља се у виду тобогана, у делу баште, који се потом враћа у објекат, у простор играонице са лоптицама. Конструкција објекта остаје у великој мери непромењена, осим што у ентеријеру добија нови елемент, транспарентни балон, који се састоји од закривљених стаклених панела, које носи челична конструкција у виду повезаних рамова. Очувањем елемената који оличавају квалитет објекта и неочекиваним и оригиналним уређењем ентеријера, све вредности су на прави начин очуване, враћајући Ливници своју препознатљивост пу-тем савремених принципа оживљавања.

Слика 5 - Предлог ревитализације и презентације Ливнице „Пантелић” студенткиња К. Димитријевић и А. Живковић, 2017.

4.4. Предлог студенткиња Јоване Ердељан и Невене Ђурић

Полазна тачка у предлогу ревитализације некадашње Ливнице, односно се на пренамену њених површина, уз што већу меру задржавања конструкције, обликовања, као и материјалног и нематеријалног наследа. Некадашњи мануфактурни простор би постао изложбено-продажни, едукативног карактера, увођењем мање конференцијске сале, као и сале са
structure is created by placement of wooden profiles which are fastened to the grounds-facing façade of the facility. They rest on the ground, and between them there are transverse stiffeners and glass and wooden fillings. This facility of great significance would become a museum and a centre for promotion of culture and education by contemporary approach to preservation.

Figure 6 - Proposal for revitalization and presentation of "Pantelić" foundry of students J. Erdešlan i N. Đurić, 2017.

5. CONCLUSIONS

In accordance with recommendations on education in the field of protection of architectural heritage, and experience from European countries, the reform of studies at the Faculty of Architecture of the University of Belgrade follows general direction and scope existing in other European countries and their education system. Although the education on undergraduate studies, attended by all students in courses dealing with the history of both general and national architecture and art, has shrunk considerably, the reform still made it possible, within elective courses on master and integrated academic studies of architecture, to expand and enrich it substantially with certain topics which were not previously explored in teaching process. Students' work on particular topics dealing with research, evaluation, protection and revitalization of architectural heritage, as well as designing in protected areas, projetorom za предавања и фил- мове везане за изложбу. Радионица и интерактивна представа би се одржавала у дограђеном проширењу. Ова нова структура, стварала би каскадни подијум и надстреху за наступе домаћих уметника и дизајнера, као и промовисање њихових дела. А уједно би давала и нову динамику амбијенту, уз потпуну очување његове аутентичности, надвијајући се изнад постојећег кровра. Конструкција анекса је омогућена постављањем дрвених профилова који су причвршћени за дворишну фасаду објекта. Ослоњени су на тло, а између профилова постоје попречна укрућења и стаклене и дрвене испуне. Савременим приступом очувања, овај објекат од великог значаја, постао би музеј и центар за промовисање културе и образовања.

Слика 6 - Предлог ревитализације и презентације Ливнице "Пантелић" студенткиња J. Ердељан и Н. Ђурић, 2017.

5. ЗАКЉУЧНА РАЗМАТРАЊА

У складу са препорукама о едукацији у областима заштите градитељског наслеђа, као и искуствима из европских земаља, реформа наставе на Архитектонском факултету Универзитета у Београду прати општи пречек и обим који постоји и у другим европским земљама и њиховом систему образовања. Мада је у великој мери умањена настава која служи предавцима предметима везаним за историју архитектуре и уметности, општу и националну, на основним
demonstrated that their engagement in these projects has enriched their education and facilitated their involvement in addressing numerous contemporary problems of protection and revitalization of historical places and ambiances. Students' concept designs pursued a common goal – to accentuate the values of the complex by contemporary presentation. With their projects, student filled the Foundry complex with numerous new contributions but serving in the function of improvement of historical, cultural and technological character and values the Foundry has possessed. A dynamic concept of continual authenticity enrichment of historical place was thus supported by changes and layers brought about by both historical time and contemporary age. In students' proposals of new amenities of cultural, artistic and multimodal character, a desire was expressed to preserve and revive this complex by attracting people, especially young users, who would familiarize themselves directly with the history and old crafts of the foundry by its presentation. Although the Cultural Heritage Preservation Institute of Belgrade submitted a proposal for revitalization of "Pantelić" foundry in 2009, in proposed students' concept designs of revitalization and presentation of the Foundry, a contribution to development research of industrial architecture of the city was made, but also to conceptualizing possibilities of its rehabilitation and sustainable development by means of new cultural-artistic amenities which would preserve this significant model of technical culture and artistic craft, with necessary adherance to guidelines and principles of international charters and recommendations.
тације и одрживог развоја кроз нове културно-уметничке садржаје који би очували овај значајан пример техничке културе и уметничког занатства, уз неопходно поштовање смерница и принципа из међународних повеља и препорука.

REFERENCES