

INTEGRATION OF REUSED AND RETROFITTED BUILDINGS IN ARCHITECTURAL-CULTURAL SURROUNDINGS IN SOUTH-WEST GERMANY

Boştenaru Dan Maria,¹ Dill Alex,² Mihăilă Marina¹

¹ 'Ion Mincu' University of Architecture and Urban Planning

² Karlsruhe Institute of Technology

Maria.Boştenaru-Dan [at] alumni.uni-karlsruhe.de, alex.dill [at] kit.edu,
marina.mihaila [at] uauim.ro

Abstract. This paper presents several case studies of reused and retrofitted buildings from Karlsruhe, Darmstadt and Heidelberg and their architectural-cultural integration in the surroundings. Reasons to replace missing parts of heritage buildings were motivated by new rules regarding materials, neglect or war damage state, but also by new developments in the neighbourhoods. Conclusions underline the impact on the surroundings of the altered buildings as being rather good. Also, the new developments which raised the profile of the surroundings would not have been possible otherwise. Reuse of buildings was justified by extension of the activities, new activities or social development. Through this the impact has been also rather good. Risks evaluation are identifying the questionable threat of the heritage character dilution in the intervention when several interventions are coupled.

Keywords: Heritage buildings, 20th century, reuse, retrofit, Germany, Karlsruhe, Darmstadt, Heidelberg

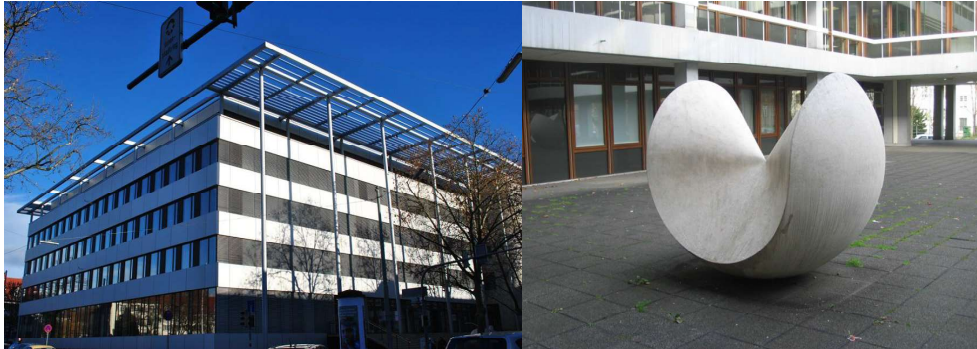
1. INTRODUCTION

COST TD1406 "Intelligent management of heritage buildings" is a European network dedicated to exchange in the field of promotion, protection and conservation of monuments. In a comparative study, we looked to several examples of industrial and church architecture, as well as neighbourhoods across the 20th century from the point of view of: replacement/reconstruction work on missing parts of heritage buildings; reuse/retrofitting of heritage buildings and sites; highlighting of heritage buildings (on site/from the distance). Methods of study included site visits, study of archives, study of relevant literature and discussions with involved specialists. A special focus was finding the looks of the buildings before and after the transform. The buildings were put in European context of other countries facing conversion of their heritage.

As methodology, the article investigates several architectural examples (from Karlsruhe, Darmstadt and Heidelberg – on reuse and retrofitting concepts of transformation, as contemporary outputs for the demarches described in research purposes, but also highlighting a personal understanding on architectural research.

2. EXAMPLES IN KARLSRUHE

The first building on the campus we looked at is the Building of the Faculty of Mathematics of the Karlsruhe Institute of Technology (Fig. 1), the largest consortium university and research centre in Karlsruhe. From this building, there is a level of protection of the five sculptures by Max Bill [1] in the atrium (<https://web1.karlsruhe.de/db/kulturdenkmale/detail.php?id=02926> [2]).



Figures 1a and 1b: The Mathematics Institute of the Karlsruhe Institute of Technology, Current State and Sculpture From the 5 famil by Max Bill (1966) with A View of the Former Institute

Sources: M Boştenaru 2016 (1a) and Wikipedia Kucharek (1b).

The building is part of the campus integrated in the forest which shaped the north of Karlsruhe. The building of the faculty of mathematics was a 1960s (1966) post-war building like many others in the campus, some (chemistry) being protected. But it featured hazardous materials (asbestos among others) for which reason of a special approach was needed to remove those structural parts, and in this process the building grew to double surface, and developed an energy facade. It won a prize for dealing with post-war substance in university milieu (Ingenhoven Architects, the architects of the Stuttgart 21 Rail Station, [3]). Exchanged parts are the asbestos and other hazardous materials present in the former structure. Now, the building deals with today's challenges in sustainability from the point of view of materials and energy. The reconstruction was done by Ingenhoven Architects with the Pfeifer structure office, a professor from the architecture faculty. Pictures before the intervention can be found at http://www.stadtarchiv-karlsruhe.findbuch.net/pics//I.._Archivische%20Sammlungen._~8_BA._~8_BA_Schlesiger._~1969._~A17_22_1_41.jpg [4]. The festive opening took place in 2015, when the city celebrated 300 years of existence. The building is located near a large parking place and the castle garden from where it is visible. The architecture of the building is remarkable, being designed by Ingehoven Architects. Access to visitors is closed when the university building is closed; this restricting access is designed for the protected statues. While the atrium was still an uncovered inner courtyard this was not the case. Information panels reflect the use as university buildings. The glass surfaces permit a play of illumination. There are no communication media about it as far as known.



Figures 2a and 2b: **Schwesterwohnheim, Today Kolleg am Ring of Wohnheim e.V. of the Karlsruhe Institute of Technology, Architects Otto Haupt, Heinrich Müller, (1951), Current State and Former Washing Salon of the Dammerstock Siedlung in Karlsruhe, Architect Otto Haesler (1929)**

Sources: M. Boştenaru, 2016; (2a) and M. Boştenaru, 2013 (2b).

The second building is the Schwesterwohnheim of Wohnheim e.V. in Karlsruhe (Fig. 2a), a self-administrated student dormitory with a collegio structure, not usual for Germany. The building is listed as monument (<https://web1.karlsruhe.de/db/kulturdenkmale/detail.php?id=00241> [2]). The building is part of the campus, together with some offices in the historic building of the hospital. It was originally student dormitory (1951, architects: Otto Haupt, Heinrich Müller), then belonged to a children hospital and now it is student dormitory again. Otto Haupt [5] built also the listed library tower which was extended recently with functional annexes. Literature dedicated to Otto Haupt is available in the SAAI Archive [6]. The other buildings of the children hospital were functional converted as well, to the international students' offices. Unlike the former one, which was an example of retrofitting, this is an example of change of use between student dormitory and hospital. The complex of the hospital building was generally redesigned for the university, in the main building coexisting university offices. The conversion involved participative approach from the self-administrated student dormitory. The building is largely free from all sides in the courtyard of the international office, but limitedly visible from the street due to abundant vegetation. The building has common settings. Access to visitors is permitted to university working hours only from outside. Standard university panels describe the use. There is no special illumination. There are no communication media on it.

From the university campus, we go to a Modernist neighbourhood. The next heritage building is the Dammerstock washing salon (Fig. 2b), another example of reuse by the architecture office Rossmann and partner in Karlsruhe. This one is a monument of special importance (<https://web1.karlsruhe.de/db/kulturdenkmale/detail.php?id=02113> [2]). It is part of a neighborhood of the Modern movement. The neighborhood [7], [8] was built following a competition from 1928, on which architects Walter Gropius and Otto Haesler [9] took part among others. The washing salon is of Otto Haessler (1929), a remarkable architect for the use of steel in housing. The redesign with change of function from washing salon for neighbourhood housing to an architecture office was done 1974 by the architects Rossmann and Partner [10], [11]. The functions of Modernist neighbourhoods changed with new lifestyle and hence they needed to be reused. The reconstruction project astonishing is the use of glass in the conversion. An archive image can be found at [3](http://open-</p>
</div>
<div data-bbox=)

archive.bauhaus.de/eMuseumPlus?service=direct/1/ResultListView/result.t1.collection_list.\$TspTitleImageLink.link&sp=10&sp=Scollection&sp=SfieldValue&sp=0&sp=4&sp=3&sp=SdetailList&sp=12&sp=Sdetail&sp=0&sp=F&sp=T&sp=12 [12]. The building is located on the other side of the Alb River and the train lines. It is the boundary building of the *Siedlung* and thus well visible and highlighted as access. The building has a remarkable character being typical for *Neues Bauen*. It is a private office with no access to visitors. A plan of the *Siedlung* with description of buildings is available. There is no special illumination and scientific colouring. There is limited paper information on the neighbourhood, and geographic information systems.



Figures 3a and 3b: **Stephaniensbad in Karlsruhe, Architect Friedrich Weinbrenner (1811)**

Sources: Historical photo Landesarchiv Baden-Württemberg, Signatur: Generallandesarchiv Karlsruhe - Archivalieneinheit 498-1 Nr. 2329, Creative commons licence (3a) and M. Boştenaru, 2016 (3b).

The following sites jump from the 20th century to another time in the history of the city, the founding time by architect Friedrich Weinbrenner (1809-11) [13]. Stephaniensbad (Fig. 3) is a building of the Evangelic Church in Karlsruhe since 1926. In 1957, it followed a new restoration after war damage. Mid 1990s it was restored again by Ruser + Partner for a new liturgical order. It is a monument on transition rule (<https://web1.karlsruhe.de/db/kulturdenkmale/detail.php?id=01820> [2]). The building is near the Alb River and the railway lines and very well integrated. Originally it was bathing building by Friedrich Weinbrenner, the architect of the city, as the area is rich in thermal water springs. Thus, there is a change of function from original use: thermal bath to present current use: church community centre. It is the inverse of a Soviet Church which was transformed into bath (German evangelic church St. Peter and Paul in Sankt Petersburg). The building is located in the valley of the Alb River and well visible from the natural landscape. Architecture of Weinbrenner offers a remarkable architectural character of Classicism. The building is only accessible to the community. Information panels, illumination and scientific colouring, communication (brochures, media, etc.), geographic information systems are limited. The inscription of the building was removed when it was functionally converted.

A church building which maintained its function but changed elements is St. Stephan Church (Fig. 4a), the Catholic Church in Karlsruhe. The building is a monument on transition rule (<https://web1.karlsruhe.de/db/kulturdenkmale/detail.php?id=02935>

[2]). From an urban perspective, the church influenced the building of the Library of Baden from the opposite side, the competition drawings of architect Aldo Rossi have studied the shape of the church. The church was built in 1808-1814 by the architect of the city: Friedrich Weinbrenner. As model, the Minerva Church in Assisi is the inspiration [14]. The church was partially destroyed in 1944 in war bombardments. The cupola was replaced by a reinforced concrete one (1951-55). An archive photo can be found at <https://www2.landesarchiv-bw.de/ofs21/olf/struktur.php?bestand=23928&klassi=001.001.002.006.005.%&anzeigeKlassi=001.001.002.006.005&letztesLimit=suchen&letztesLimitUnterebenen=20&baumSuche=&standort=&inhaltHauptframe=unterebenen&unterebenenId=7313553> [15]. The church was renovated 2011 for new liturgical reasons (now the order of chairs is in round shape). The building is surrounded by open places where yearly Christmas market takes place. It is well visible from almost all sides. Architectural highlighting is given by the central church shape of Weinbrenner inspired by the Minerva temple in Assisi. Access to visitors is permitted most of the time. Information panels (location, informative) are limited. Illumination and scientific colouring is not done. There are communication media on the church functioning. Also, the Majolica factory produces images of the church as characteristic for the city.



Figures 4a and 4b: **Sankt Stephan church in Karlsruhe, Architect Friedrich Weinbrenner (1814)** and **Façade of the ECE Centre in Karlsruhe, in the Middle the Preserved Façade of the Chamber Theatre (1872)**

Sources: M. Boştenaru, 2015 (4a) and M. Boştenaru, 2006 (4b).

On the Via Triumphalis by architect Weinbrenner, which goes out from the honour courtyard of the castle, there is the Rondell place with a building also by architect Weinbrenner and across it the former chamber theatre, now integrated in the facade of the ECC Shopping mall (Fig. 4b), owned by ECE in Karlsruhe. This façade had to be maintained as listed as monument building (<https://web1.karlsruhe.de/db/kulturdenkmale/detail.php?id=02405> [2]). When the shopping mall was built, several buildings were demolished. However, the monument - with listed facade of the former theatre chamber (1872 House Stemmermann, part of via Triumphalis of architect Friedrich Weinbrenner) had to be kept in the new facade design done by architects Kramm et Strigl [16]. The new facade of the shopping mall is a media façade; the project is from 2000 and got a 1st prize. It is an example of both elements changes (the back part of the construction disappeared) and change of use from original use: theatre to current use: shopping mall. The facade to the Rondell Place in Karlsruhe had to be kept in the new development; the missing parts were replaced by the new construction. Currently the historic facade is under restoration. The building is located at Rondell Place one part of the Via Triumphalis by the city founder architect Weinbrenner. The

combination between old and new gives a special architectural highlighting. Access to visitors is permitted when the shops are open. Information panels present the shopping mall, information on the historical building is limited. Illumination and scientific colouring is present in the media façade, meaning the new adjacent part. Communication (brochures, media, etc.) and geographic information systems are limited.

3. EXAMPLES IN DARMSTADT

Mathildenhöhe (Fig. 5a) in Darmstadt [17], administrated by Institut Mathildenhöhe [18] is a monument with application for UNESCO: it will be decided in 2020. This is a neighbourhood of Art Nouveau [19] and some of the buildings became museums. The inner artist colony was active between 1899 and 1914. Some of the houses ateliers are designed by star architects of the time (ex. architect Peter Behrens). It is a change of use, from artist colony to museum in an urban Art Nouveau neighbourhood, a coherent complex of buildings. The special shapes of Art Nouveau local style in search of a new language are quite remarkable. Access to visitors is permitted in the museum areal. Information panels (location, informative) present the way to the site. Illumination and scientific colouring are not present. Communication (brochures, media, etc.) are prepared for the integration in UNESCO.



Figures 5a and 5b: **Mathildenhöhe in Darmstadt, View to the so-called Wedding Tower by Joseph Maria Olbrich (1908) and Industrial Slaughter Hall at the Bürgerparkviertel in Darmstadt, Architect Kramm et Strigl (1999)**

Sources: M. Boştenaru, 1999 (5a) and M. Boştenaru, 1999 (5b).

Another neighbourhood is the so-called Bürgerparkviertel (Fig. 5b) [16], including two monuments, the slaughterhouse and another house. The neighborhood was built by Bauverein AG in Darmstadt, federal state of Hessen. The former administration and industrial building are integrated in a housing and office complex in original design, and the other buildings are new. Building and restoration were conducted by the architecture office Kramm et Strigl as a result of a competition. The industrial building was built in 1920. The redesign of the area happened in 1999 under the name Bürgerparkviertel (park quartier of people). It is another example of change of use, into architecture office, which involved changes of design elements. Two buildings of the former industrial area which are monuments were kept, among them the slaughterhouse and an administrative building, and they were integrated in the new neighbourhood. The building is part of a neighbourhood at the present periphery of the city. The integration of the slaughterhouse under the new building is enhancing attention. Industrial architecture is well interacting with the

new elements. It is a private office with no access to visitors; information panels, illumination and scientific colouring, and communication (brochures, media, etc.) are limited.

From this federal state, we chose only 20th century buildings, the final one being the State Theatre (Fig. 6), owned by Hessisches Baumanagement, Regionalniederlassung Süd, Darmstadt. The restoration of the theatre became better integrated, from the point of view of car circulation. Restoration of the postwar building of Rudolf Prange (1972) – competition: 1963 – was designed by architecture office Lederer in 2006. It was included in the catalogue of the Wüstenrot Stiftung competition [20]. It is one of the biggest theatres in Germany from postwar time. The theatre missed some fire protection issues, and showed lacks in design construction and building physics. New stairs and a bar were built; light concrete was added for better light reflection and acoustics, as well as new lighting system. In the urban context, a new open air stage was designed. The reconstruction project got a mention in the competition of Wüstenrot Stiftung 2002. Having natural highlighting (geographic location, visual attraction in the landscape), it is a building of a remarkable architecture of postwar time. Access to visitors is permitted during the show. Information panels (location, informative) present the way to the landmark integration. The building is scenographical night illuminated since the beginning, as the archive photo shows. The building has been presented in books as example of restoration.



Figure 6: **State Theatre in Darmstadt, Architect Rudolf Prange (1972)**

Source: Photograph by Alex Dill, 2010.

4. EXAMPLE IN HEIDELBERG

From this second city in the federal state of Baden Württemberg we chose only one example, another conversion of a thermal bath in new function: Altes Hallenbad (old bath hall, Fig. 7). Owner was Hans Jörg Kraus (when the municipality sold to him). The building is a monument; it is on the way from the Railway Station to the old city, and includes a passage connecting two opposite streets and attracts visitors. The building by architect Franz Sales Kuhn used to be a public bath in Art Nouveau style from 1906 [21]. It was closed in 1981. In 1989 it was designed to be renovated, but for financial reasons this was not possible. It was transformed in restaurant use in 2013 [22]. In the context of Heidelberg, a city which strongly maintained of the historic substance, this building is rather common designed. Access to visitors is allowed to the gastronomic part, but not all former bathing parts are accessible. Definition of the building is painted on it. Illumination and scientific colouring, communication (brochures, media, etc.), are not known.



Figures 7a and 7b: **Alte Schwimmhalle in Heidelberg, Architect Franz Sales Kuhn, (1906)**

Sources: Wikipedia (7a) and M. Boştenaru, 2016 (7b).

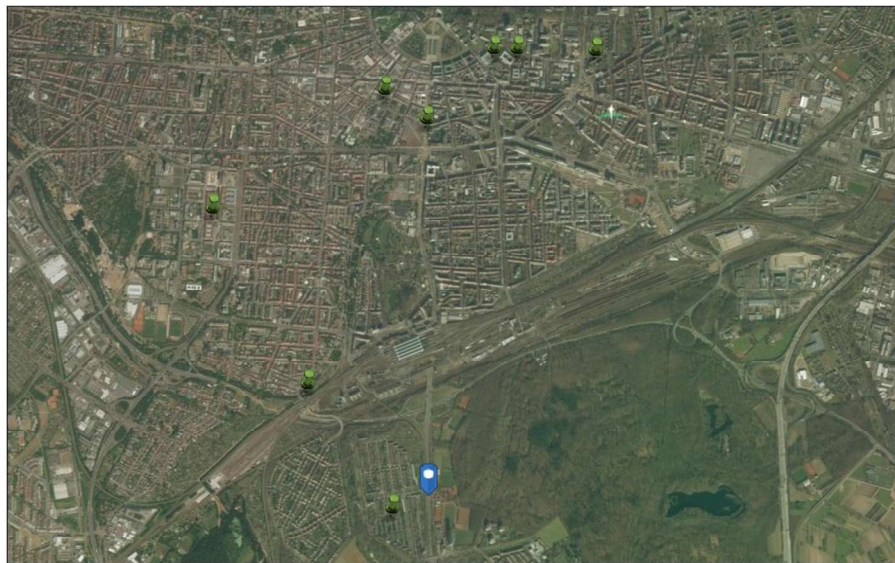
5. DISCUSSIONS AND CONCLUSIONS

Figures 8 show the sites of the case studies in the plan of the cities. In Karlsruhe, it can be distinguished between the Campus area and the South-West part with early 20th century developments, as well as the centre of the city with the Weinbrenner developments. The sites in Darmstadt are situated diverse and rather at the periphery. In Heidelberg one can see on the map the placement in relation to the Kurfürstenanlage. From the maps the belonging to parts of the city developed in certain times of history can be drawn. The new developments led to enhancement of the areas they are placed in, but still architectural-cultural awareness of the population is necessary. The materials of the intervention in case of replacement have to be highlighted. And this highlighted is of great importance for city/areal tourism.

While the reuse and the replacement of elements discussion regards the heritage buildings, highlighting them regards the surroundings and both regard how to communicate heritage. A further investigation will relate to use of virtual reality for representing heritage buildings in their surroundings, such as Heidelberg castle in

Germany. We mentioned also the incursion into the legal protection of buildings, which in Germany is different from federal state to federal state, and more data was available for Baden Württemberg. This also concerns the surroundings design settings. From the part related to heritage buildings, more work is necessary regarding the optimized protection and the conservation of damaged parts of heritage buildings. In the latter case study classical restoration classifies, and we aim to look at another Modernist piece, the Villa Tugendhat which was restored by an international committee. An example included here is the State Theatre in Darmstadt. The working group further intends to look at the correlation between visual and technological characteristics, what we call it architecture sincerity. Aesthetics and sincerity must be in design accordance, but also reversibility is also gaining importance. Documentation and monitoring of heritage buildings and their surroundings is extending the aims of DOCOMOMO from Modernism to all buildings. In what regards surroundings, a special importance will be given to the green spaces around the heritage buildings, such as those of the neighbourhood, the campus, or the neighbouring forest. For other examples not included in this paper which are castles, this important surrounding is the castle park. Finally, training shall be provided for the preservation of buildings, sites and neighbourhoods of any time in history.

Karlsruhe



March 17, 2017

1:36,112
0 0.3 0.6 1.2 mi
0 0.35 0.7 1.4 km
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus
DS, USDA, USDA, AeroGRID, IGN, and the GIS User Community



Figures 8a, 8b and 8c: **Case Study Locations within Their Respective Cities**

ACKNOWLEDGEMENTS

The present paper is part of research cooperation program COST TD1406 “Intelligent management of heritage buildings”, and based on the STSM research project of the main author, Maria Boştenaru Dan.

REFERENCES

- [1] Vitali, C., Hüttinger, E., Bill, M. (1987), Max Bill, Retrospektive. Skulpturen Gemälde Graphik 1928–1987. Katalog Schirn Kunsthalle, Frankfurt/Zürich/Stuttgart.
- [2] Stadt Karlsruhe: Datenbank der Kulturdenkmale <http://web1.karlsruhe.de/db/kulturdenkmale/> [17.03.2017].
- [3] Bauphysik (2016) „Aktuell“ Bauphysik 6/2016
- [4] Stadtarchiv Karlsruhe http://www.stadtarchiv-karlsruhe.findbuch.net/php/main.php?ar_id=3747 [17.03.2017].
- [5] Eissler, H. (1990), Haupt, Otto, Architekt, in Badische Biographien. Neue Folge, Band 3. Kohlhammer, Stuttgart, pp. 119–120.
- [6] Kleinmanns, J. (2015), „Das saai – Südwestdeutsches Archiv für Architektur und Ingenieurbau am Karlsruher Institut für Technologie KIT“, Archivar. Zeitschrift für Archivwesen. 68, 3, pp. 229-230.
- [7] Franzen, B. (1997), Neues Bauen der 20^{er} Jahre: Gropius, Haesler, Schwitters und die Dammerstock-Siedlung in Karlsruhe Sondereinband.
- [8] *** (2001) Weiße Vernunft. CD-ROM für MacOS 7.5x u. Windows 95. Siedlungsbau der 20^{er} Jahre
- [9] Oelker, S. (2002), Otto Haesler: Eine Architektenkarriere in der Weimarer Republik, Dölling und Galitz Verlag.
- [10] Stadt Karlsruhe: Stadtgeschichte https://www.karlsruhe.de/b1/stadtgeschichte/kulturdenkmale/denkmaltag_archiv/denkmaltag_2004/dammerstock/waschhaus.de 17.03.2017

- [11] Rossmann, E. (1992), Rossmann und Partner, Werkbericht 1952-1991, Dva.
- [12] Bauhaus Archiv: Walter Gropius open archive <http://open-archive.bauhaus.de/eMuseumPlus> 17.03.2017
- [13] Stadt Karlsruhe Städtische Galerie, saai | Südwestdeutsches Archiv für Architektur und Ingenieurbau am KIT (2015), Friedrich Weinbrenner (1766-1826): Architektur und Städtebau des Klassizismus Gebundene Ausgabe, Michael Imhof Verlag.
- [14] Schmidt-Bergmann, H., Bräunche, E.O. (2008) Friedrich Weinbrenners Weg nach Rom: Bauten, Bilder und Begegnungen, INFO Verlag.
- [15] Landesarchiv Baden-Württemberg <https://www.landesarchiv-bw.de/web/46734> 17.03.2017
- [16] Durth, W., Honold, K. (1999), Kramm & Strigl - Buildings and Projects /Bauten und Projekte, Axel Menges.
- [17] Stadt Darmstadt (ed.) (1999) Die Mathildenhöhe, ein Jahrhundertwerk. Mathildenhöhe Darmstadt. 100 Jahre Planen und Bauen für die Stadtkrone 1899-1999. Band 1, Darmstadt.
- [18] Institut Mathildenhöhe (ed.) (1999) Künstlerkolonie Mathildenhöhe Darmstadt 1899-1914. Darmstadt.
- [19] Wiest, E. (2016), Die Geburt des Darmstädter Jugendstils, Toeche-Mittler.
- [20] Jessen, J., Krämer, S., Kuhn, G., Kulka, P. (2008) Umbau im Bestand: Gestaltungspreis der Wüstenrot Stiftung, Karl Krämer, Stuttgart.
- [21] Deutsche Bauzeitung (1908) „Das Hallenschwimmbad in Heidelberg“. In: Deutsche Bauzeitung 46, 1908, p. 309–313
- [22] Baer-Schneider, C. (2013), „Eine lange Leidenszeit geht zu Ende. Das Alte Hallenbad in Heidelberg – und was davon übrig blieb“. In: Denkmalpflege in Baden-Württemberg 2/2013, p. 95–101.

Article distributed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License (CC BY-NC-ND).