



From Knowledge to Wisdom

ISSN 1934-7359 (Print)

ISSN 1934-7367 (Online)

DOI:10.17265/1934-7359

Journal of Civil Engineering and Architecture

Volume 17, Number 1, January 2023



David Publishing Company
www.davidpublisher.com

Journal of Civil Engineering and Architecture

Volume 17, Number 1, January 2023 (Serial Number 182)



David Publishing Company
www.davidpublisher.com

Publication Information:

Journal of Civil Engineering and Architecture is published monthly in hard copy (ISSN 1934-7359) and online (ISSN 1934-7367) by David Publishing Company located at 3 Germay Dr., Unit 4 #4651, Wilmington DE 19804, USA.

Aims and Scope:

Journal of Civil Engineering and Architecture, a monthly professional academic journal, covers all sorts of researches on structural engineering, geotechnical engineering, underground engineering, engineering management, etc. as well as other issues.

Editorial Board Members:

Dr. Tamer A. El Maaddawy (Canada), Prof. San-Shyan Lin (China Taiwan), Dr. Songbai Cai (China), Prof. Vladimir Patricevic (Croatia), Dr. Sherif Ahmed Ali Sheta (Egypt), Prof. Nasamat Abdel Kader (Egypt), Prof. Mohamed Al-Gharieb Sakr (Egypt), Prof. Marina Traykova (Bulgaria), Prof. Olga Popovic Larsen (Denmark), Prof. George C. Manos (Greece), Dr. Konstantinos Giannakos (Greece), Pakwai Chan (Hong Kong), Chiara Vernizzi (Italy), Prof. Michele Maugeri (Italy), Dr. Giovanna Vessia (Italy), Prof. Michele Di Sivo (Italy), Prof. Valentina Zileska-Pancovska (Macedonia), Dr. J. Jayaprakash (Malaysia), Mr. Fathollah Sajedi (Malaysia), Prof. Nathaniel Anny Aniekwu (Nigeria), Dr. Marta Słowik (Poland), Dr. Rafael Aguilar (Portugal), Dr. Moataz A. S. Badawi (Saudi Arabia), Prof. David Chua Kim Huat (Singapore), Dr. Ming An (UK), Prof. Ahmed Elseragy (UK), Prof. Jamal Khatib (UK), Dr. John Kinuthia (UK), Dr. Johnnie Ben-Edigbe (UK), Dr. Yail Jimmy Kim (USA), Dr. Muang Seniwongse (USA), Prof. Xiaoduan Sun (USA), Dr. Zihan Yan (USA), Dr. Tadeh Zirakian (USA), Dr. Andrew Agapiou (UK), Prof. Diana Šimić Penava (Croatia).

Manuscripts can be submitted via Web Submission, or e-mailed to civil@davidpublishing.com or civil@davidpublishing.org. Submission guidelines and Web Submission System are available at <http://www.davidpublisher.com>.

Editorial Office:

3 Germay Dr., Unit 4 #4651, Wilmington DE 19804, USA

Tel: 1-323-984-7526; Fax: 1-323-984-7374

E-mail: civil@davidpublishing.com; civil@davidpublishing.org; shelly@davidpublishing.com

Copyright©2023 by David Publishing Company and individual contributors. All rights reserved. David Publishing Company holds the exclusive copyright of all the contents of this journal. In accordance with the international convention, no part of this journal may be reproduced or transmitted by any media or publishing organs (including various websites) without the written permission of the copyright holder. Otherwise, any conduct would be considered as the violation of the copyright. The contents of this journal are available for any citation. However, all the citations should be clearly indicated with the title of this journal, serial number and the name of the author.

Abstracted/Indexed in:

Cambridge Science Abstracts (CSA)

Ulrich's Periodicals Directory

Chinese Database of CEPS, Airiti Inc. & OCLC

Summon Serials Solutions, USA

China National Knowledge Infrastructure (CNKI)

Turkish Education Index

Google Scholar

ProQuest, USA

J-Gate

Subscription Information:

\$720/year (print)

David Publishing Company

3 Germay Dr., Unit 4 #4651, Wilmington DE 19804, USA

Tel: 1-323-984-7526; Fax: 1-323-984-7374

E-mail: civil@davidpublishing.com; civil@davidpublishing.org; shelly@davidpublishing.com

Digital Cooperative Company: www.bookan.com.cn



David Publishing Company

www.davidpublisher.com

Journal of Civil Engineering and Architecture

Volume 17, Number 1, January 2023 (Serial Number 182)

Contents

Bridge Engineering

- 1 **Structural Capacity Assessment of Cultural Bridges Key Study Dragoti Bridge**
Arian Lako, Shk ëqim Gjevori and Xhorxhia Lako
- 12 **Seismic Assessment of Existing Bridges: Kukesi Bridge**
Arian Lako, Shk ëqim Gjevori and Xhorxhia Lako

Urban Planning

- 24 **Inclusiveness in City Centre—A Case Study: 30-E-Tir Street in Tehran**
Sanaz Shobeiri
- 44 **Between Old and New: Urban Interventions in German City Centres**
Michele Caja

Architectural Research

- 52 **Cultural Review of the Value Conflicts of Architectural Design**
Na WANG and Xinghuo YE

Between Old and New: Urban Interventions in German City Centres

Michele Caja

DABC-Department of Architecture, Built Environment and Construction Engineering, Politecnico di Milano, Milano 20133, Italy

Abstract: The collective memory of European cities is preserved not only in monuments and urban artefacts, but also in the minute structure of urban parcels and blocks, in the layout of streets, squares and natural elements. This memory, often canceled and partially removed during last century, survives beyond its material dimension, also through the representation of its image transmitted to us through iconographic documents. Through these documents we can imagine these spaces that have slowly built up over time as real lieux de mémoire. The rebirth of those places inside German historical centers is based on different levels: the morphological layout of urban spaces and blocks, the typological solution of each house, the urban image recreated, between philologic re-proposal and critical reinterpretation. The aim of regaining its lost historicity depends on the appropriateness of architectural and technical solutions adopted in each project, beyond too simplistic oppositions between terms like Old & New or Authentic & Fake. In this sense, such case-studies are not to be understood as nostalgic attempts to reproduce the city as it was, nor as artificial simulacra or hyperrealities, but as mature examples of critical reconstruction, according to the meaning introduced in the European debate since the 1970s.

Key words: Collective memory, critical reconstruction, Old & New, urban image.

1. Introduction

The following contribution deals with recent cases of critical reconstruction of historic urban centres in Germany. These projects are considered here as examples of a cultural, architectural, and urban strategy based on the memory of their lost image.

The memory of these cities—like that of many other European cities—is preserved in the form of urban spaces and monumental buildings, but also in the remaining traces of streets and city blocks. Those blocks were once characterised by building density, the minute structure of the plots subdivision, the type of narrow and deeply lots and individual townhouses.

This characteristic structure of the historic city—based on blocks divided in single parcels—dates to medieval times even if it was completed during the centuries with buildings of different historical styles: from Renaissance to Baroque to Neoclassical. In many cases, it was then altered or completely erased by tragic

events or ideological reasons: wars, infrastructural interventions, modern ideas of city.

Nevertheless, its urban image (Stadtbild) persists to the present day thanks to the iconographic testimony that has been handed down to us, as in the case of the centre of Dresden depicted by the Italian painter Bernardo Bellotto in his famous views. Through these, it has been possible to restore today the architectural and urban complexity of these unique and exceptional places that have been built up over the centuries (Fig. 1).



Fig. 1 Bernardo Bellotto, Neumarkt in Dresden, 1747.

Source: Hermitage.

1.1 From the Lost Centre to the Heart of the City

The awareness of this memory dates to the 1950s when, for the first time, the crisis of European cities emerged as central point of discussion. Following war damages, and subsequent transformations related to vehicular traffic and technical-functional issues, the pre-existing historical fabric was literally erased or reduced to an urban fragment.

As discussed at the 8th *CIAM (Congrès Internationaux d'Architecture Moderne)* held in 1951 in Hoddeson (UK), by the most influential personalities in the architectural debate of the time, the heart was understood not only as the fulcrum of urban life proportionate to the human scale, but also as a representative and symbolic element for the cultural identity of a community [1].

The merit of such a new perspective extended to the long history of the European city was to highlight how Modern urbanism had completely ignored, if not deliberately removed, the dense and compact structure of historic centres. This had mostly been replaced by open settlement patterns and large-scale typologies.

The loss of the centre, which had been identified by Hans Sedlmayr as a current moment of crisis in the artistic sphere, seemed to be reflected here also in the urban and architectural sphere [2].

Following the debate introduced in the 1970s and 1980s on the reconstruction of the European city [3], the heart of the city will become central theme again in German context after the fall of the Berlin Wall [4].

2. Methodology

The methodology used here to look at and analyse these case studies is based on different tools. On the one hand, it is referred to the tradition of morpho-typological analysis, as developed in Italian and British context in the 1960s, by the Muratorian and Conzenian school [5, 6]. On the other, methods of investigation are adopted taken from archaeology, based on stratigraphic excavation, and iconology. Finally, it is based on the principle of critical reconstruction as theorised and put into practice in France, Belgium and Germany in the

1970s-1980s.

2.1 Morphology, Typology, Land Use

A first point of view for looking at and analysing these case studies is morphology and typology, where morphology means the shape of the city, the layout of its streets and paths, the form and structure of its urban blocks. While by typology we consider the shape of the houses and buildings that occupy the parcels of individual blocks.

The definition of a parcelled block is particularly important for understanding the subdivision of the inner surface of each urban block into individual parcels. These cadastral parcels were originally based on private ownership of urban land. Only later they were often merged and used according to the principle of collective and undivided use.

2.2 Archeological/Iconological Point of View

Another important aspect concerns the archaeological perspective adopted to re-read the urban history. Through such an expanded view, the contemporary city is understood as the result of a series of successive phases developed over time, often superimposed one upon the other.

It is precisely this archaeological viewpoint that unites these projects with the first experiences of critical reconstruction in the 1970s. Similarly, in the more recent interventions analysed here, there is a desire to bring to light urban layouts and building volumes from the past. Here, however, there is a greater adherence to the historical iconography handed down, with the intention of restoring its original urban image in a more faithful manner.

2.3 The Reconstructive Approach

More generally, the projects considered here inaugurate a new phase in the history of reconstruction—or reconstruction of history, as the German historian Winfried Nerdinger has well illustrated it [7]—of Europe's historic centres in the 20th century.

The first post-war reconstruction phase saw several

historic European cities reborn according to their pre-existing historical image. The reconstruction of the historic centres of Warsaw and Gdansk in Poland, Münster in Germany, and Colmar in France aimed at restoring the historic façades of the disappeared houses, behind which functional and distributional destinations were often introduced different from the original ones.

The second phase of the 1970s-1980s attempted in different ways to re-propose the settlement and typological structure of the historic blocks, in this also experimenting with new building processes. The most appropriately conservative experience of the Bologna centre was conducted by the Italian architect and town planner Pier Luigi Cervellati [8].

A phase shortly following these experiences is the movement of critical reconstruction theorised in the mid-1970s in the Franco-Belgian sphere, starting with the exhibition *Rational Architecture: The Reconstruction of the European City*, promoted by the Krier brothers and others [9]. This would lead a few years later to the famous experience of the *Internationale Bauausstellung Berlin (IBA 1984/87)*, coordinated by Josef Paul Kleihues [10].

3. Memory and Invention of the Old City

The rebuilding of parts of the historic city from scratch involves several issues, foremost among which is the impossibility of restoring its original aura, as defined in philosophical terms by Walter Benjamin [11]. To keep the relationship with traditions alive—as British historian Eric Hobsbawm has well explained in general terms—one must often resort to imagination, if not outright reinvention [12].

Where for such invention one must rely in many cases on collective memory, as defined by the French sociologist Maurice Halbwachs [13], on which Aldo Rossi would base his theory of the urban artifacts [14]. This is the only way to understand the recent notion of *lieux de memoire* theorised by Pierre Nora [15] and the relationship between history, memory and oblivion, as investigated by Paul Ricouer [16].

3.1 Correcting the City

The principles on which these projects are based involve different issues, especially related to the way of looking at the contemporary city as a palimpsest of different, often contradictory ideas of city. It is precisely the coexistence of these different, fragmentary historical thresholds in the present day that leads one to take a position on them.

This implies making choices, according to a corrective attitude, which in some cases even leads to drastic operations, such as resorting to demolition. Among the various reasons that led to this choice, the main one can be explained as a response to the crisis of representation and identity that these centres have undergone since the post-war period.

The aim of these projects is also to regenerate new parts of the old city, reusing if present surviving fragments and traces. The re-construction of a corrected new version of the lost historical image tries to be as plausible as possible.

3.2 Demolishing to Rebuild

A first paradigmatic case in this respect is Hildesheim, the capital of Lower Saxony, where a post-war building was demolished to allow the reconstruction of the old medieval ensemble. For the reconstruction of the most representative historic building on the *Marktplatz*, an anonymous hotel with typical 1960s International Style shapes was removed.

The *Knocherhaueramtshaus*, the butchers' guild house—described by the German historian Georg Dehio as the most monumental of all wooden houses in Germany—has been rebuilt according to the typical half-timbered structure common to the buildings facing the square (Fig. 2) [17].

After this experience, the other cases followed a similar strategy of punctual replacement. At the *Neumarkt* in Dresden, a concrete Moloch dating back to the 1980s, the extension of the Police Headquarters, had to be removed to allow the reintegration of the original perimeter of one of the

eight existing blocks, the Quartier III, rebuilt in the last two decades [18].

At the Friedrichswerder in Berlin, the Aussenministerium (Foreign Ministry, 1964-1967) was demolished after reunification to allow the reconstruction of the pre-existing urban blocks. Built during the socialist regime on Schinkelplatz, the building occupied part of the area on which the Bauakademie once stood, next to the Friedrichswerdersche Kirche behind it, both masterpieces by Karl Friedrich Schinkel [19].

In Frankfurt, the Technische Rathaus (Technical Town Hall, 1972-1974)—an out-of-scale concrete and steel building with British-style brutalist forms—was removed in 2010 to allow the construction of the Dom-

Römer Areal. This area, which once connected the cathedral with the main square of the old city, was reconstructed according to the original layout of small streets and squares [20].

In Potsdam, the large building complex on Friedrich-Ebert Strasse (the former Teacher Training Institute, later FHP-Fachhochschule Potsdam) was recently removed. New urban blocks are being built around the Neumarkt, retracing the old historical situation around the rebuilt Castle by Peter Kulka (Fig. 3) [21].

In Lübeck, two schools from the 1960s were also removed to regenerate the original structure of the medieval parcelled blocks of the Gründungsviertel.



Fig. 2 Hildesheim: The hotel Rose from the 1970s and the reconstructed Knochenhaueramtshaus.



Fig. 3 Demolitions (from top left): Police Headquarters, Dresden; Foreign Ministry, Berlin; Technical Town Hall, Frankfurt a. M.; Teacher Training Institute, Potsdam.

3.3 The Mixed Model

Different from Hildesheim, the mixed model adopted here is based on the coexistence of *Leitbauten* and *Neubauten*: pilot-buildings reconstructed as they were where they were and new buildings inspired by the original ones. The relationship between old and new oscillates here between philological reproduction and critical reinterpretation.

This model will be adopted for the first time at the beginning of the new millennium in the eight urban blocks rebuilt around Dresden's Neumarkt, in parallel with the reconstruction of the Frauenkirche, one of the city's religious symbols. The overall ensemble—which is still being completed—was able to regenerate the complex spatiality of the original squares and streets developed once around the cathedral.

Similarly, the Dom Römer Areal in Frankfurt—which won the prestigious MIPIM Award 2019—consists of a collection of small townhouses: about one-third are copies of the originals, and the rest are entrusted to a wide range of different architects. Here,

too, the original small-scale structure of the historic fabric is redefined according to a careful reinterpretation of buildings from different eras, from the Middle Ages to the Renaissance and Baroque (Fig. 4).

The validity of the mixed model seems to be reconfirmed in the other two cases analysed here. The blocks around the Alter Markt in Potsdam, which re-propose the spatiality of the historic square, are based on a general plan (*Leitbautenkonzept*) from 2012, according to which different types of strategies have been identified. These oscillate between two cases: the faithful reconstruction of the original façades of 18th-century buildings—imported mainly from Italy according to Palladian and Renaissance models and reconstructed as copies of copies (Palazzo Barberini, Pompei and Chiericati) [22]; the new houses, subject to pre-established urban guidelines (Fig. 5).

In Berlin, the blocks on Schinkelplatz and Werderscher Markt—strategic locations in the third historic nucleus of the Friedrichswerder—have been completed by different architects, based on a master

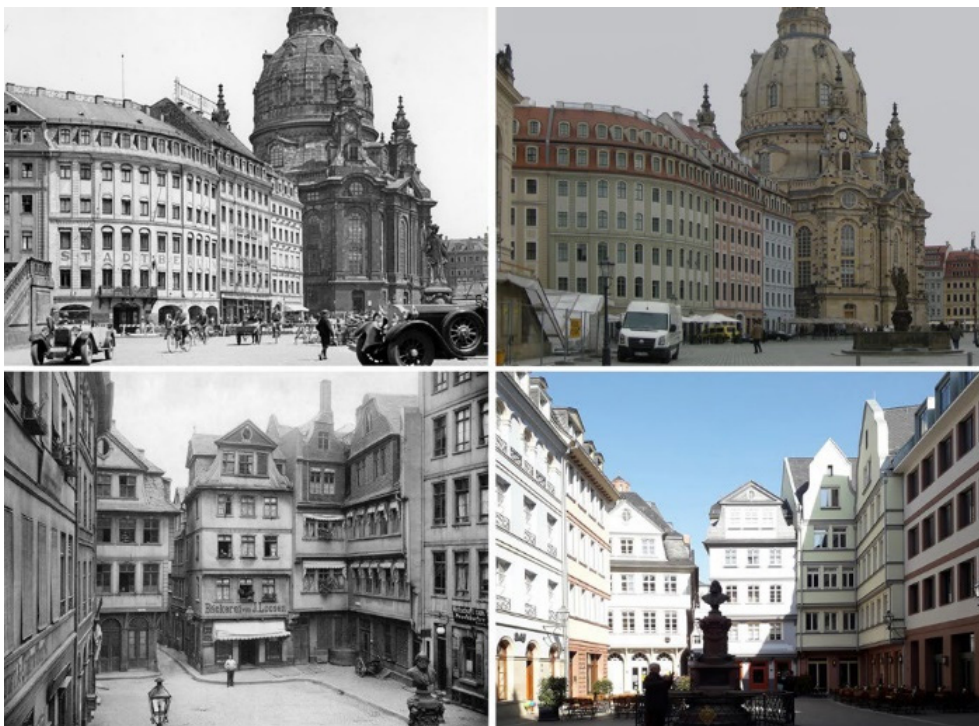


Fig. 4 Old & New (from top left): Dresden, Neumarkt: Quartier I, before World War II and today; Frankfurt, Dom Römer Areal: Hühnermarkt, in 1904 and today.



Fig. 5 Copies of copies: Potsdam, Alter Markt: Palazzo Barberini in 1907 (photo: E. Eichgrün) and today (Arch. Hilmer & Sattler and Albrecht).

plan drawn up by local architect Klaus Theo Brenner. This plan is based on a structure of lots passing from street to street and a block house typology with terraces opening onto inner courtyards.

Based on the 2015 Rahmenplan Gründungsviertel—which saw the active participation of UNESCO—a similar philosophy was followed in Lübeck. Here narrow and elongated city blocks are to be reconstructed, where pilot buildings coexist alongside contemporary reinterpretations of the Gothic-merchant houses typical of the Hanseatic city [23].

4. A Didactic Proposal for Frankfurt

Developed as a Master Thesis work at Politecnico di Milano [24], the following proposal starts after a deep analysis of the above-mentioned Dom Römer project in Frankfurt am Main, which extends from the Römerberg to the Cathedral. The project has inaugurated a new phase in reconstructive strategies in historical contexts, based on a careful analysis of the historical stratigraphy but also in relation to actual urban requirements.

The selected area concerns the blocks around the Cathedral: on the West side, defining the main square called Garküchenplatz, on the Eastern side defined by a big residential courtyard complex dating back to the 1950s. This complex is made of blocks built in the 60s, according to typical affordable architecture of suburban housing estates. In that way, the rich complexity of former public spaces, once existing on the East side of the Cathedral, was transformed into a system of private

and semi-private courtyards, whose configuration does not allow free circulation and limits the viewpoints.

The units of the new proposed masterplan are traced above the map dated 1928, literally tracing the limits of its blocks. The intention is to densify the area, even if keeping the quarter streets and the inner courtyards wider than in the medieval times.

Hence, for the new masterplan it was decided to continue the Dom Römer strategy and to develop a similar approach based on urban correction. The aim is to extend the morphological and typological layout of the old town from the Cathedral till the Kurt-Schumacher Street—an important traffic axis and primary road going from the bridge through the Main River and connecting two parts of city.

The facade solution is based on the analysis of historical facades of the Frankfurt old town and Dom Römer project taken as a reference. New facades are mainly developed without strong historical reference since clear pre-war photographs were found only for the hotel building.

The presented proposal for Garküchenplatz in Frankfurt am Main follows the principle based on critical reconstruction: This principle allows considering which features of the pre-war architecture are significant for the local authenticity and should be used, and which one can be changed as out of date. Taking only the footprint from the original blocks, the new ones are defined by a variety of typologies developed according to actual way of living.



Fig. 6 Frankfurt a. M., Garküchenplatz: Up from the left: in red the proposed blocks on the original layout (in gray, 1928); general masterplan of the area around the square and Kurt-Schumacher Street. Bird's eye view of the central block and the isolated Hotel building; Detail of a Townhouse

The new buildings are not trying to imitate the past or to create an illusion of original construction. They are demonstrating how we can use original elements and materials in a contemporary way. In this way the project tries to create a site-specific architecture, in respect of local traditions, but reinventing their typologies and materiality, avoiding so a pure mimetic approach towards a new way of living in the city (Fig. 6).

5. Conclusions

From the case studies analysed, a new way of dealing with the historic city emerges, understood not only as a simple model to be evoked in abstract forms, but as a concrete reference. The reproducibility of this model considers the original type—morphological and compositional characteristics, but also, the importance of architectural aspects, construction methods and

contemporary requirements dictated by current sustainability criteria, avoiding in this way an operation of mere reproduction.

References

- [1] Rogers, E. N., Sert, J. L., and Tyrwhitt, J. 1952. *The Heart of the City. Towards the Humanization of Urban Life*. New York: Pellegrini and Cudahy.
- [2] Sedlmayer, H. 1957. *Art in Crisis. The Lost Center*. London: Hollis and Carter Ltd.
- [3] Delevoy, R. L. 1978. *Rational Architecture, La reconstruction de la ville Européenne*. Brussels: AAM. (in French)
- [4] Lampugnani, V. M., and Mönninger, M. 1991. *Berlin morgen. Ideen für das Herz einer Großstadt*. Stuttgart: Hatje. (in German)
- [5] Muratori, S. 1960. *Studi per una operante storia urbana di Venezia*. Roma: Istituto Poligrafico dello Stato. (in Italian)
- [6] Conzen, M. R. G. 1969. *Alnwick, Northumberland: A Study in Town-Plan Analysis*. London: Institute of British Geographers.
- [7] Nerdinger, W., Eisen, M., and Strobl, H. 2010. *Geschichte*

- der Rekonstruktion. Konstruktion der Geschichte.* München: Prestel. (in German)
- [8] Cervellati, P. L., Scannavini, R., and De Angelis, C. 1977. *La nuova cultura delle città.* Milano: Edizioni scientifiche e tecniche Mondadori. (in Italian)
- [9] Krier, L. 1978. "The Reconstruction of the City." In *Delevoy.* Brussels, pp. 38-42.
- [10] Hämer, H.-W., and Kleihues, J. P. 1984. *Idee Prozess Ergebnis. Die Reparatur und Rekonstruktion der Stadt.* Berlin: I.B.A. 1987/Fröhlich & Kaufmann. (in German)
- [11] Benjamin, W. 2008. *The Work of Art in the Age of Mechanical Reproduction (1936).* London: Penguin Books Ltd.
- [12] Hobsbawm, E. J., and Ranger, T. 1983. *The Invention of Tradition.* Cambridge: Cambridge Univ. Press.
- [13] Halbwachs, M. 1949. *La mémoire collective.* Paris: Presses Universitaires de France. (in French)
- [14] Rossi, A. 1966. *L'architettura della città.* Padova: Marsilio. (in Italian) *The Architecture of the City.* Translated by Diane Ghirardo and Joan Ockman. Cambridge, MA: The Mit Press 1982.
- [15] Nora, P. 1989. "Between Memory and History: Les Lieux de Memoire." *Representations* 26: 7-24.
- [16] Ricoeur, P. 2004. *Memory, History, Forgetting.* Chicago: The University of Chicago Press.
- [17] Häger, B. 2011. "Der Marktplatz zu Hildesheim und das Knochenhaueramtshaus." *Arch+* 204: 70-5. (in German)
- [18] SAK (Sächsische Akademie der Künste) and Stadtplanungsamt der Landeshauptstadt Dresden. 2008. *Historisch contra modern? Erfindung oder Rekonstruktion der historischen Stadt am Beispiel des Dresdner Neumarkts.* Dresden: Akademie der Künste u. Stadtplanungsamt. (in German)
- [19] Stimmann, H. 2014. *Berliner Altstadt. Neue Orte und Plätze rund um das Schloss.* Berlin: Dom Publisher. (in German)
- [20] Sturm, P., and Cachola Sturm, P. 2018. *Die immer Neue Altstadt. Bauen zwischen Dom und Römer seit 1900.* Frankfurt a.M./Berlin: Jovis. (in German)
- [21] STP (Sanierungsträger Potsdam GmbH). 2012. *Potsdam. Der Weg zur neuen Mitte.* Berlin: Nicolai. (in German)
- [22] Burg, A., and Caja, M. 2014. *Potsdam & Italien. Die Italienrezeption in der Potsdamer Baukultur.* Potsdam: FHP. (in German and Italian)
- [23] Caja, M. 2019. *Neue Projekte in historischen Deutschen Städten/Nuovi progetti in centri storici tedeschi.* Firenze: Aión, p. 23. (in Italian)
- [24] Novoseltseva, A. 2021. "Frankfurt am Main. Garküchenplatz. Architectural design for residential block." M.Sc. thesis, Architecture and Urban Design, Politecnico di Milano, Supervisor: Prof. M. Caja.



Journal of Civil Engineering and Architecture

Volume 17, Number 1, January 2023

David Publishing Company

3 Gerday Dr., Unit 4 #4651, Wilmington DE 19804, USA

Tel: 1-323-984-7526; Fax: 1-323-984-7374

<http://www.davidpublisher.com>, www.davidpublisher.org

civil@davidpublishing.com, civil@davidpublishing.org, civil_davidpublishing@yahoo.com

