

# OPINION

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For the dissertation "**PAPER IN ARCHITECTURE. TENDENCIES AND INNOVATIONS**" for awarding the **Doctoral** Degree in Professional Studies 5.7 Architecture, Construction and Geodesy, Academic Specialty "Theory and History of Architecture"

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## **1. General description of the presented materials**

The set of materials presented in connection with this procedure is exhaustive and includes all necessary documents in accordance with the Law on the Development of Academic Staff in the Republic of Bulgaria (ZRARB).

The dissertation contains 139 pages of text, bibliography and application with images. The sources include 19 Cyrillic titles, 16 Latin titles, 5 laws, regulations, regulations, 33 materials from websites and additional literature with 46 titles. The text is structured in the following sections - introduction, 3 chapters and conclusion.

## **2. Relevance of the topic and relevance of the tasks**

The dissertation raises the question of use of paper in architecture - a topic in itself exciting with the images and associations it provokes, and at the same time intriguing because of the contradiction between the ephemeral nature of this material and the inherent striving for durability of the architectural object.

The relevance of the topic is clearly justified in the introduction to dissertation work. The PhD student deals with two main aspects of the existence of the architectural form - temporary and lasting, and emphasizes the importance of the material for its creation and perception.

The use of paper in the construction of contemporary architectural objects is a phenomenon of increasing prevalence and significance, which confirms the need to study this phenomenon. Its specific properties make it an inexhaustible source of inspiration the search for original and sustainable architectural solutions.

The PhD student makes her research in the context of contemporary studies on the use of paper as an innovative material whose qualities reduce the negative impact of

construction on the environment and enable the rapid and effective solution of social problems.

The object and the subject of the study are correctly defined. The author directs her attention to the study of different architectural forms, that use paper as building material to outline its influence on contemporary architectural trends, as well as its innovative application in life.

The aim of the dissertation: **to define trends for development of the paper material and its modifications in the present and the future of architecture** is clearly defined and convincingly justified. The boundaries of the study are precisely defined in terms of chronology and scope.

The tasks that the doctoral student sets out to achieve this goal are fulfilled. The research methodology is based on analysis and synthesis. Comparative analysis is used to clarify the advantages and disadvantages of the use of paper in the construction of various types of architectural objects.

### **3. Characteristics and evaluation of the thesis**

The dissertation is very well structured and complies with formal requirements for volume and content. The PhD student consistently develops her thesis, building on the research made so far of the use of paper in architecture. The existing trends for its application as building material are examined, and forecasts are made for future development. Impressive in number and adequacy examples of design solutions and completed projects were selected. The dissertation is structured in 3 chapters, introduction and conclusion. Each chapter includes a presentation and summary of the most important topics. The introductory part clearly defines the object, subject, purpose, boundaries, methodology, the tasks and expected results of the study.

**Chapter One** traces the history of the appearance and use of paper from antiquity to the present day. The PhD student has selected suitable sources to prove that paper is inherently a material that can be used for a variety of purposes and in various forms in the home, industry, construction, transport, science and the arts. The author carefully analyzes the use of paper in architecture by examining the two main aspects of its application as building material and as a symbol. Its pragmatic and semantic manifestations and their syntactic combination in architectural practice are explored. Based on this analysis, the doctoral student concludes that paper is suitable for the implementation of three current architectural trends - creating a connection with nature, reducing the weight of building materials and keeping in line with traditions. Through the work of one of the key contemporary artists using paper, the Japanese architect Shigeru Ban, the doctoral student convincingly demonstrates its ability as a constructive and formative element. Important for the study is the analysis of the categories "*permanent*" and "*temporary*" in architecture. It serves as the basis for the next, **second chapter**, which is dedicated to the application of paper in the so-called "*temporary architecture*" related to the construction of shelters following natural disasters or wars, as well as short-lived buildings - festivals, concerts, and others. In her research, the doctoral student clarifies the nature of disaster situations and

presents various concepts for the rapid construction of prefabricated housing, in response to the urgent need for shelter. The use of paper in this case is motivated by its specific qualities which allow prototyping, quick assembly, easy transportation, recycling and reuse. In a series of very well selected examples the author analyzes the advantages and disadvantages of the various solutions related to functionality, durability, resilience to weather conditions and more. On the basis of this analysis drawn out are some basic design principles such as typology, functionality, modularity and combinability.

By thoroughly examining the use of paper in the works of Shigeru Ban, the PhD student convincingly proves the **possibilities to achieve unique solutions tailored to the needs of people based on one universal approach**. "Paper Log House" implementations in disaster areas around the world show the ability to adapt "paper architecture" to different climates and its flexibility in regarding the use of materials and labor that are available on local level.

The doctoral student sees the power of paper as building material for the creation of temporary architectural forms for holding festivals and exhibitions. There it is a means of construction, and with it - an exhibit of these events that give room for experimentation and innovation. The comparative analysis shows the advantages and disadvantages of its implementation in two types of architectural objects, diametrically opposed to the occasion, emotional workload and content.

Paper can compete quite well with well-known building materials due to its accessibility, light weight, speed of construction, lack of the need for specialized workforce, assembly and opportunities for recycling. Despite her admiration for paper architecture, the doctoral student objectively assesses the appropriateness of temporary asylum from paper in terms of durability, cost and comfort of living. She sees greater potential for development in the implementation of paper for temporary events because of the objective possibility of expressing its symbolic importance and to reach original solutions.

**Chapter three** examines paper in the context of Japanese traditions and their interpretation in the work of Shigeru Ban. The focus is placed on its social and experimental architecture, which is often the result of contemporary understanding of traditional construction techniques. The main moments in the work of the Japanese architect are summarized and some basic principles are brought out that can be followed by contemporary architects. The doctoral student demonstrates a thorough knowledge of Japanese architecture and the place that paper occupies in it. In her presentation, she carefully examines the influence of traditions to discover the possible applications of the material in modern conditions. Analyzed are the main principles of construction such as modular repetition, folding, interlacing and others subordinate to the philosophy of minimalism, use of local materials and connection with nature.

The doctoral student thoroughly studies the constructive and formative role of paper in the construction of architectural sites and concludes that its implementation is

valuable when based on the use of its inherent qualities, and not as an end in itself, as a substitute for known building materials.

The study of architectural details and connections so specific when paper materials are used become an important part of the dissertation. Investigated, systematized and richly illustrated are various assemblies and joints.

Analyzed by the author is how paper behaves in limited in size objects with a short life-span and other significantly larger structures, where paper is used alongside other more durable materials such as wood and metal. Paper is used individually or in interaction with them in the construction of structures and architectural form.

In the conclusion to the dissertation the doctoral student summarizes the conclusions and results of the study, in accordance with the tasks set. The properties of paper that make it a suitable construction material are systematized. There are different forms of application and it is the typology of the architectural objects for which the paper is suitable as building material that are traced. Trends and innovations of its use have been clarified, as well as its relation to traditional construction practices. Possibilities for application of paper in architecture in Bulgaria are evaluated.

#### **4. Contributions and importance of the dissertation**

The dissertation has indisputable scientific-theoretical contributions and such connected with application. The author fulfills her tasks and fulfills her aim.

*I consider the most important scientific contributions of the work to be that it:*

1. Introduces the topic of paper use in architecture as important and up-to-date research topic.
2. Reveals the roots of the use of paper as construction material and summarizes the links between "paper" and traditional architecture.
3. Formulations of the concept of "temporary architecture" and systematization of the architectural forms associated with it.
4. Proves the thesis that paper can be one of the material expressions of temporary architectural objects.

*Contributions in the scientific- applied aspect.*

1. Systematize paper application options in the architectural form.
2. Classification of architectural joints and details using paper.

#### **5. Notes and recommendations**

The dissertation presented is a valuable theoretical material. Written intelligently and in depth, it is a truly fascinating reading.

I recommend publishing a monograph based on the dissertation work in order to get a wider resonance. To that end, I suggest the illustrations to be included along with the text so that they can be traced more easily.

#### **8. Conclusion:**

The materials presented by the doctoral candidate are up-to-date with the requirements of ZRASRB and the legal framework, as well as of UACEG Internal Rules for the Development of Academic Staff.

The abstract reflects in detail the content of the dissertation.

The in-depth analysis and the summaries, conclusions and guidelines are the individual work of the author who successfully uses scientific methods to prove her own thesis.

The proposed dissertation will be useful for architectural theory and practice and will undoubtedly contribute to the emergence and development of new architectural concepts. These contributions will enrich the existing theoretical knowledge.

In view of the stated above, I give my positive opinion to the research done and I suggest to the distinguished academic jury to award the author - arch. Veselina Mireva, a Doctorate Degree in Professional Studies 5.7 Architecture, Construction and Geodesy, Academic Specialty "Theory and History of Architecture".

Reviewer: .....

Assoc. Prof. Dr. Arch. Milena Nanova

Sofia, 22.01.2020