

The Architecture of Industrial Buildings in City Conditions

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Abstract

The study focused on examining the formation processes and stages of development of industrial building architecture in Uzbekistan's cities. This text discusses the issues surrounding the design of industrial buildings, including the challenges in their architectural development, methods for improving their design, and the key needs for such buildings. Additionally, it presents the scientific foundations for industrial building projects.

Keywords: Industrial buildings and firms, free economic zones, pre-built transport warehouses, structural solutions, technological process, technical specifications.

Introduction

The arrangement of buildings in space has a crucial role in organizing people's everyday activities and work processes. Therefore, the quality of buildings is primarily determined by how well they fit these functions and activities. The range of functional attributes of buildings is not just defined by their ability to reflect the intricate and diverse requirements of humans and society, the inherent qualities of the location, and the advancements in science and technology. The perception of a building's suitability for its intended function and its level of comfort undergoes considerable changes over time. Therefore, the extent to which structures may be adjusted to meet new requirements is considered one of their most crucial attributes. An architectural work encompasses not just fascination, but also aesthetic elegance [1]. Architecture, being one of the oldest and most significant art forms, has a profound impact on individuals. The form and ambience of architecture have a profound impact on human emotions. Architecture caters to a broad range of both physical and emotional demands of individuals. The creation of beauty and efficiency in architecture is achieved through a unified process of form development. The acceptability of an architectural work is assessed not only based on its adherence to technical specifications, but also on its ability to effectively address a wide variety of tasks assigned by society. Thus, in our ongoing investigation, we have identified the artistic resolution of industrial buildings and their adherence to technical specifications.

The primary component. The Republic of Uzbekistan has formulated an action strategy for its development from 2017 to 2021, which encompasses five key priority areas. These five approaches are executed sequentially, with each stage necessitating the endorsement of an individual annual state program named after the corresponding year[2]. The fourth stage of the action strategy focuses on steadily enhancing employment opportunities and actual income levels

for the population, with the aim of advancing the social sector, enhancing the social protection and healthcare systems, promoting greater social and political engagement of women and girls, constructing affordable housing and infrastructure for transportation, engineering, communication, and social services. It enables the execution of specific initiatives aimed at enhancing and updating infrastructures, advancing education, culture, science, literature, art, and sports, and enhancing the government's approach to youth policy. Architecture, dating back to ancient times, not only fulfilled practical purposes but also aimed to structure prevailing concepts in society and address the requirements of the state and the public. At this juncture, it suffices to recollect the renowned words of our esteemed ancestor Amir Temur: "If you harbour any uncertainty regarding our might, simply observe the edifices we have erected"^[3]. Whether one was a visitor to the Registan Square in Samarkand or not, the sight of the skyscrapers and intricately decorated facades would undoubtedly evoke admiration for the architects and craftsmen who brought these monuments to life through their creative vision, as well as for the emperors whose authority commanded their construction. The transience of thoughts is inevitable. Following the establishment of the Republic of Uzbekistan, significant transformations occurred in architecture, as well as in other domains. In 1995, upon independence, the Republic of Uzbekistan enacted the "Architecture and Urban Planning" law for the first time in its history. I hold this statute in great esteem for its impact on our architecture and urbanism, as well as other disciplines, from the early years of our independence. Therefore, significant emphasis was placed on the architectural planning of industrial structures and the establishment of job opportunities in proximity to metropolitan areas. Implementation of construction, design, and environmental adaption tests for diverse industrial structures commenced in urban areas^[4]. Industrial buildings and structures must meet various economic requirements during their design, construction, and use. It is essential to minimize costs and ensure that they are designed and built in a cost-effective and economical manner. In order to achieve this objective, many design, planning, and construction solutions are devised in advance, and then compared to identify the best cost-effective and practical choice. Factors such as location, the feasibility of using local construction materials, and transportation expenses influence the prices of buildings and structures ^[5]. Moreover, the utilization of prefabricated components in the construction of structures through industrial, highly mechanized techniques results in decreased construction costs and enhanced efficiency throughout their lifespan. Currently, the utilization of computers in design and efficient projects has been enhanced.

Architectural and artistic design refers to the process of creating the visual and structural aspects of a building, including its interior and exterior appearance, finishing details, and overall structure. The aim is to ensure that these elements, based on their significance, fulfill the aesthetic preferences of individuals. Based on these specifications, the development of a substantial industrial architectural ensemble complex should be highly conspicuous.



Architectural design for a compact industrial zone

The design of industrial buildings is contingent upon the characteristics of the technical process housed within the building[6]. The technological process is determined by the production-technological scheme, which encompasses the arrangement of machine tools, the characteristics of internal lifting transport equipment in terms of appearance and load-carrying capacity, the range of products, and the designated areas for preparing specific series of finished goods. The factors that determine the outcome include the size (ranging from large to little), sequential location, internal temperature, humidity level, and so on. The technological scheme illustrates the sources of raw materials, the management of industrial waste, and the positioning and transportation of engineering networks. In the context of production automation, the technological scheme involves the arrangement of automated pathways and the performance of numerous processes in the processing and assembly of products [7]. The master plan of the enterprise incorporates the spatial arrangement of buildings and structures, including their mutual position and distances between them, as well as the overall technological strategy of the enterprise.

When designing industrial buildings and structures, four primary concerns are addressed simultaneously: 1. To provide a design strategy for buildings and structures that is better suited to the proposed technological procedure. 2. Engineering-constructive solutions involve guaranteeing the durability and importance of contemporary building materials and structures to meet the necessary standards for various buildings and projects. 3. Architectural-artistic level refers to ensuring that the visual design of buildings, structures, and the overall enterprise ensemble fulfill the standards of artistic excellence. 4. From an economic standpoint, it is essential to minimize the expenses associated with the development and operation of buildings and structures.



A comprehensive perspective of a textile firm located within the Urgut free economic zone.

The conformity criteria encompass various aspects such as the building's fitness for its intended purpose, the optimal placement of technical machinery within the building, the operating needs of the building, its expected service life, and the dimensions and design considerations, among others. The technical requirements for buildings encompass the prioritization of building structures, considerations for long-term use, fire safety precautions, and the utilization of industrial construction methods [8]. Architectural artistry necessitates that a structure has an aesthetically pleasing and opulent outside while also adequately meeting the demands of its occupants.

Conclusion industrial buildings gradually enhance their production capacity in response to market demand and supply, while also prioritizing the need for adaptability. Considering the current state of industrial development, it is advantageous to utilize buildings that can readily accommodate changes in production technology or accommodate different forms of production without requiring modifications to the architectural and structural aspects. These kind of buildings are referred to as universal or flexible. In the industrialized areas of Uzbekistan, these complexes are currently referred to as "Free Economic Zones". Efforts are being made to enhance their architectural and artistic aesthetics, as well as to reinforce their position within the urban planning system.

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