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RESEARCH ARTICLE

ARCHITECTURAL STYLES OF INDUSTRIAL BUILDINGS IN THE CITIES OF UST-KAMENOGORSK AND SEMIPALATINSK IN THE XIX AND EARLY XX CENTURIES

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Abstract. *This article considers the industrial architecture of cities of East Kazakhstan, i.e. Semipalatinsk and Ust-Kamenogorsk during the period of the end of XIX-beginning of the XX centuries. Also, the stylistic peculiarities of those objects are determined. The authors' concept is: the industrial architecture has artistic individuality. So, the aim of the article is to determine its placement within the architectural heritage of Kazakhstan of the specified period. The authors studied architectural and planning specific of those objects, determine their compositional features as related to industrial architecture of the cities of East Kazakhstan. They also examined stylistic development of the industrial architecture and pointed out its value as related to the architecture of that period. The authors studied according archival and literary sources and handled the measurement and photo fixation of the objects. The method of comparative analysis was applied to determine the architectural specific of the objects as compared with public and residential buildings. The authors implemented architectural and artistic analysis of historic buildings and pointed out both stylistic and artistic trends of the industrial architecture on the whole. Thus, the prevailing style of the industrial buildings which were erected in the old city centers was the so called "brick" one. Also, the "eclectic" style which had some interpretations of the "order" and "modern" ones took place. Thus, the architectural image of the considered cities was developed on the basis of both public and industrial buildings in the kind of the urban-planning accents.*

Keywords: *industrial buildings, decorative pilasters, segmental arches, rusticated pilasters, steam mills, industrial enterprises, urban structure*

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ҒЫЛЫМИ МАҚАЛА

XIX ҒАСЫРДЫҢ СОҢЫ – XX ҒАСЫРДЫҢ БАСЫНДА ӨСКЕМЕН ЖӘНЕ СЕМЕЙ ҚАЛАЛАРЫНДАҒЫ ӨНЕРКӘСІПТІК ҒИМАРАТТАРДЫҢ СӘУЛЕТТІК СТИЛДЕРІ

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Аңдатпа. *Бұл мақалада XIX ғасырдың аяғы мен XX ғасырдың басындағы Шығыс Қазақстан қалаларының, атап айтқанда Семей мен Өскеменнің өнеркәсіптік сәулеті қарастырылады. Бұл құрылымдардың стильдік ерекшеліктері де анықталған. Авторлардың тұжырымдамасы бойынша, өнеркәсіптік сәулет өнері көркемдік ерекшелікке ие. Сондықтан мақаланың мақсаты – осы кезеңдегі Қазақстанның сәулет мұрасындағы оның орнын анықтау. Авторлар бұл құрылымдардың сәулеттік және жоспарлау ерекшеліктерін зерттеп, олардың Шығыс Қазақстанның өнеркәсіптік сәулеті аясындағы композициялық ерекшеліктерін анықтады. Олар сондай-ақ өнеркәсіптік сәулет өнерінің стилистикалық дамуын зерттеп, сол кезеңдегі сәулет өнері аясындағы құндылығын атап өтті. Авторлар мұрағаттық және әдеби дереккөздерді зерттеп, құрылымдарды өлшеп, суретке түсірді. Бұл құрылымдардың қоғамдық және тұрғын үй ғимараттарымен салыстырғандағы сәулеттік ерекшелігін анықтау үшін салыстырмалы талдау әдісі қолданылды. Авторлар тарихи ғимараттардың сәулеттік-көркемдік талдауын жүргізіп, тұтастай алғанда өнеркәсіптік сәулет өнерінің стилистикалық және көркемдік үрдістерін атап өтті. Осылайша, ескі қала орталықтарында салынған өнеркәсіптік ғимараттардың басым стилі «кірпіш» деп аталатын стиль болды. Модерн элементтерін қамтитын «эклектикалық» стиль де кең тарады. Осылайша, бұл қалалардың сәулеттік келбеті тек қоғамдық ғимараттармен ғана емес, сонымен қатар қала құрылысы мәселелерін ескере отырып, өнеркәсіптік ғимараттармен де қалыптасты.*

Түйін сөздер: *өндірістік ғимараттар, сәндік пилястрлар,доғалы аркалар, руста лған пилястрлар, бу диірмендері, өндірістік кәсіпорындар, қалалық құрылым*

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НАУЧНАЯ СТАТЬЯ

АРХИТЕКТУРНАЯ СТИЛИСТИКА ПРОМЫШЛЕННЫХ ЗДАНИЙ В ГОРОДАХ УСТЬ – КАМЕНОГОРСКЕ И СЕМИПАЛАТИНСКЕ В XIX-НАЧАЛЕ XX ВЕКА

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Аннотация. *В статье рассматривается промышленная архитектура городов Восточного Казахстана, а именно Семипалатинска и Усть-Каменогорска, в период с конца XIX по начало XX веков. Также определены стилистические особенности этих объектов. Концепция авторов такова: промышленная архитектура обладает художественной индивидуальностью. Таким образом, цель статьи – определить её место в архитектурном наследии Казахстана указанного периода. Авторы изучили архитектурную и планировочную специфику этих объектов, определили их композиционные особенности в контексте промышленной архитектуры городов Восточного Казахстана. Они также исследовали стилистическое развитие промышленной архитектуры и указали на её ценность в контексте архитектуры того периода. Авторы изучали архивные и литературные источники, проводили измерения и фотофиксацию объектов. Для определения архитектурной специфики объектов в сравнении с общественными и жилыми зданиями был применен метод сравнительного анализа. Авторы провели архитектурно-художественный анализ исторических зданий и указали как на стилистические, так и на художественные тенденции промышленной архитектуры в целом. Таким образом, преобладающим стилем промышленных зданий, возводимых в старых центрах городов, был так называемый «кирпичный» стиль. Также получил распространение «эклектичный» стиль, в котором присутствовали элементы модерна. Таким образом, архитектурный облик рассматриваемых городов формировался на основе не только общественных, но и промышленных зданий с учетом градостроительных акцентов.*

Ключевые слова: *промышленные здания, декоративные лопатки, лучковая арка, рустованные пилястры, паровая мельница, городская структура*

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CONFLICT OF INTEREST

The authors state that there is no conflict of interest.

The authors declare that no generative artificial intelligence technologies or AI-based tools were used in the preparation of this article.

АЛҒЫС / ҚАРЖЫЛАНДЫРУ КӨЗІ

Зерттеу жеке қаржыландыру көздерін пайдалана отырып жүргізілді.

МҮДДЕЛЕР ҚАҚТЫҒЫСЫ

Авторлар мүдделер қақтығысы жоқ деп мәлімдейді.

Авторлар мақаланы дайындау барысында генеративті жасанды интеллект технологиялары мен жасанды интеллектке негізделген технологияларды пайдаланбағанын мәлімдейді.

БЛАГОДАРНОСТИ/ИСТОЧНИК ФИНАНСИРОВАНИЯ

Исследование проводилось с использованием частных источников финансирования.

КОНФЛИКТ ИНТЕРЕСОВ

Авторы заявляют, что конфликта интересов нет.

Авторы заявляют о том, что при подготовке статьи не использовались технологии генеративного искусственного интеллекта и технологии, основанные на искусственном интеллекте.

1 INTRODUCTION

It is of vital importance to research almost unknown aspect of the architectural heritage of Kazakhstan - the industrial structures which were erected in the XIX - XX. One of the important components of the architecture of the XIX-early XX century cities of Eastern Kazakhstan (Semipalatinsk, Ust-Kamenogorsk,) is the architecture of industrial buildings and structures.

So, it is absolutely necessary to draw our attention to that type of architecture as it has very special features. It can be noted that, despite the overall stylistic *"koine"* resulting from the spread of leveling architectural trends from the metropolis in the 19th and early 20th centuries, the architecture of industrial buildings and structures acquired highly distinctive individual features. This phenomenon was evidently influenced by the active industrial development of that period, which in turn sparked considerable interest and attention toward the aesthetics of such buildings. At the same time, this "typological branch" of architecture has not received sufficient attention in specialized literature.

Accordingly, this article proposes and examines the hypothesis of the architectural and artistic individuality of industrial architecture objects, even though they were created within the framework of a common stylistic background. It is also important to emphasize that none of the buildings or structures replicate one another in terms of their spatial composition or the artistic design of their façades.

The purpose of the research to be specified in this article is to determine the significance of this segment of architectural heritage and the role that industrial architecture played within the context of 19th–early 20th century architecture in the cities of Eastern Kazakhstan. In compositional and typological terms, the industrial architectural sites developed the general features characteristic of the overall stylistic direction of architecture in Eastern Kazakhstan's cities during the 19th and early 20th centuries; however, each structure ultimately acquired a unique architectural and artistic appearance.

Thus, the following are the targets of the research.

So, it is necessary to:

- analyze the architectural and planning characteristics and identify the typical compositional features of industrial architecture in the cities of Eastern Kazakhstan;

- examine the stylistic and artistic development of industrial construction within the corresponding architectural trends of urban design;

- determine the place of industrial architecture within the 19th–early 20th century urban architecture of Eastern Kazakhstan as city-forming dominants.

Prominent and reputable researchers of Kazakhstan architectural heritage have dealt with the stylistics of industrial architectural objects. They are: M.V. Kozlov, V.N. Kashlyak, M.M. Larionov, G.A. Isabayev, E.M. Baitenov, A.S. Espenbet. The overview of their researches dedicated to this scientific problem is developed in the special part of the paper below as it needs detailed consideration. A.A. Yanushkevich, who visited the city in the 1940s, wrote that the city's industry consists of several tanneries and mills (**Yanushkevich, 1984**). Subsequently, lard-melting and soap-making factories began to appear (**Semipalatinsk, 1984**), but they were not perfect and did not meet the abundance of raw material. For example, the soap factory of the merchant Baymurat Rafikov in 1854 had one soap cauldron, it was serviced by two contracted workers. The tannery of third-guild merchant Yakov Malikov in 1854 had one oak-making machine, there was only one vat at the lard-melting factory of the merchant of the second guild Abdyshev, it was serviced by two people (**Semipalatinsk, 1984**). Industrial enterprises were built mainly in the north-western part of the city. In terms of production volume and the primitiveness of their equipment, these enterprises were typically artisanal (**Semipalatinsk, 1984**).

In 1864 there were already four tanneries with 23 workers in Semipalatinsk, and in the late 70s there were already 47 factories (**Semipalatinsk, 1984**), but all this did not meet the needs of the city and the administration took measures to promote the development of industry (research of the physical and geographical conditions of the region, the opening of schools, the issuance of benefits

to entrepreneurs from treasury, etc.) (**Semipalatinsk, 1984**). The results did not slow down to have an impact - in the 70s and 80s, the number of industrial enterprises in Semipalatinsk increased significantly and their productivity increased (**Semipalatinsk, 1984**). "In the last quarter of the XIX century a number of enterprises for the primary processing of agricultural raw materials were established in the city – mills, leather and shoe factories, sheepskin and fur coats factories, felt boot factories, soap factories, etc." (**Semipalatinsk, 1984**) By 1900 the city had 4 tard melting factories, 6 soap factories, 4 tanneries and 1 woolen mill, factories producing alcoholic beverages, steam mills.

There were 25 industrial enterprises in Semipalatinsk (**Semipalatinsk, 1984**). There were three pottery factories and 19 brick factories in the city. The rapid growth of commercial agriculture and the availability of sales markets led to the creation of large flour milling enterprises in the city – joint-stock flour companies - Musin & Co., Krasilnikov & Co., Pleshcheyev & Co. In 1920, in the city of Semipalatinsk had over 100 industrial enterprises, the largest of them: two large flour steam mills, two tanneries, a mechanical plant, a sheepskin plant, a wool washing plant, a cooperage plant, an intestinal plant, a brewery, brick factories, a power plant, two printing houses, the Zaton ship repair workshops, the railway depot of the Semipalatinsk station, and the former Piskunov sewing workshops. (Semipalatinsk, 1984). In 1923, there were about 950 private handicraft workshops in the city. By January 1, 1924, 16 large enterprises had been restored in the city (Semipalatinsk, 1984). By the end of 1927 in Semipalatinsk, the restoration of industry was almost complete.

In 1927, a tannery was being built in the city, and the construction of a cloth factory was being prepared (**Semipalatinsk, 1984**). During the first Five–Year Plans, food industry enterprises were built (a meat cannery, a mill), in the 30s a railroad tie treatment plant was built, and a sheepskin tannery began operation.

During the Second World War, factories from other republics were evacuated to Semipalatinsk, such as the 164-165 Kiev Shoe factory, a sewing factory, a sewing factory from Donbass, etc. During the war period, 9 factories were built, restored and put into operation in the city. In the post-war period, during the first post-war five-year plan, industrial production growth exceeded the pre-war level by 30%. By the early 60s, it had become one of the centers of light industry in Kazakhstan. Important industries were the sewing, leather, fur, and shoe industries. Currently, Semipalatinsk is home to the most powerful food industry enterprises in the republic, as well as large factories in the construction industry. The rapid growth of industrial construction in the city reinforces the history of the formation of industrial centers in Eastern Kazakhstan. Of the industrial construction sites that have survived to this day, two are of particular interest – a hardware and fittings factory (a former mill), a pumping station building and a water tower.

The historical and architectural scientific base on the history and architecture of Semipalatinsk is quite extensive. The following sources were used in the study (**Yanushkevich, 1984; Semipalatinsk, 1984; Baitenov, 1985a. Baitenov, 1985b. Baitenov, 1985c**). In the 1980s-200s, a number of works were republished that mentioned historical information about the cities of Eastern Kazakhstan (**Palass, 2000; Gaines, 2004; Finsch, Brem, 1982**). In the 1980s, studies of the architectural heritage of Semipalatinsk were conducted (**Baitenov, 1985 a,b**). Architectural and artistic features of folk architecture of Eastern Kazakhstan are revealed in the monograph of Baitenov E.M. (**Baitenov, 2004**), as well as in other publications (**Kozlov, 2000 ;Kashlyak, 2004; Larionov, 2006; Baitenov & Espenbet, 2024 a; Baitenov, Espenbet, 2024 b**). In 1992, a dissertation research appeared, touching upon the stylistic features of architecture, including that of Eastern Kazakhstan in the second half of the 19th - early 20th centuries (**Isabaev, 1992**), which was issued in 2017 as a monograph. In the dissertation research of the author of the article, urban architecture of the 19th - early 20th centuries is considered (**Espenbet, 2010**), and some other publications are also used (**Baitenov & Espenbet, 2024 a,b**). The article uses archival materials: Materials of the Central State Historical Archive of the Russian Federation; Materials of the State Archive of the Omsk Region of the Russian Federation; Materials of the Central State Archive of the Republic of Kazakhstan.

2 MATERIALS AND METHODS

The following main materials and methods were used in the preparation of this article:

- Analysis of archival and literary sources: these constitute one of the primary foundations of the research and a necessary segment, given that a significant portion of the heritage has lost its original appearance.

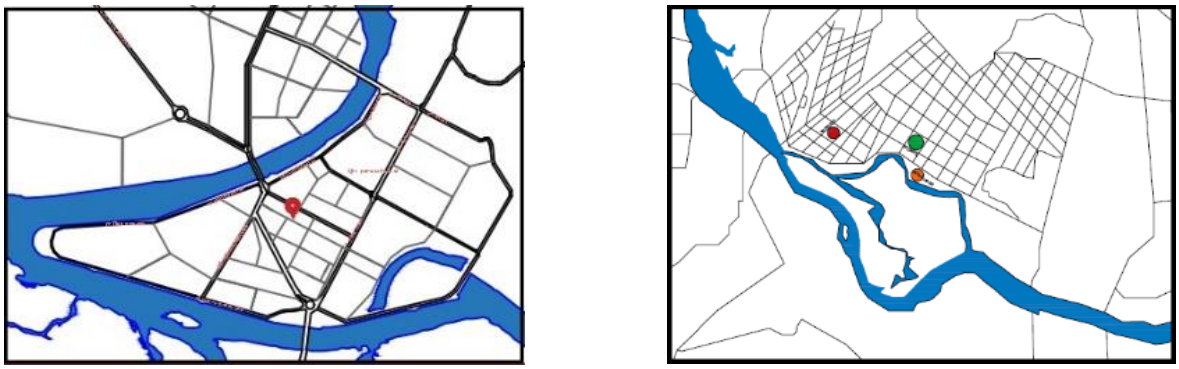
- Field surveys conducted by the authors, including measurements of monuments and photographic documentation, serving as factual material on which the study is based.

- Comparative analysis: this method is used to identify the architectural features of industrial buildings in comparison with residential and public structures.

- Architectural and artistic analysis of historical urban fabric of the period under study, considered a valuable source for understanding the development of stylistic trends and artistic directions that shape the city's architectural "face." This type of analysis reflects the main specificity of the research, as architectural and artistic features can only be identified through such an approach. The full stylistic spectrum of industrial architecture is revealed as a synthesis of materials (fired brick), decorative masonry techniques ("porebrik," "begunets," etc.), proportions (heavier, more monumental compared to residential and public buildings), and so forth.

- Comparison and identification of conceptual approaches in the artistic techniques used in the industrial buildings under study. This is a specific approach aimed at solving the particular research problem, focusing precisely on these objects within the architectural fabric of Eastern Kazakhstan.

Overall, from compositional and typological perspectives, the industrial architecture objects developed common features determined by the specifics of Semipalatinsk and Ust-Kamenogorsk. This corresponds to the general stylistic orientation of 19th–early 20th century architecture in the cities of Eastern Kazakhstan (**Figure1**).



a) b)

Figure 1 – Schemes of industrial objects' placement within the urban environment:
a) Ust-Kamenogorsk: 1 – buildings of O.F. Kostyurin's mechanical workshops.
b) Semipalatinsk: 1 – building of the hardware and fittings factory, 2 – building of the pumping station, 3 – building of the water tower (author's material)

3 RESULTS AND DISCUSSION

This section presents the studied materials on industrial architecture of East Kazakhstan and specifies the obtained results. The time frame is limited by the period of development of industrial buildings and structures of Semipalatinsk, Ust-Kamenogorsk from the end of the 18th century (historical reference) to the beginning of the 20th century. The rapid growth of commercial agriculture and the availability of sales markets led to the creation of large flour milling plants of joint-stock flour milling companies in the city - Musin and Co., Krasilnikov and Co., Pleshcheyev and Co. There were also three pottery factories and 19 brick factories in the city, which met the increased construction needs. Of the industrial construction projects that have survived to this day, of particular interest are the hardware and fittings plant (former Musin's mill), the pumping station building

and the water tower, O. Kostyurin's mechanical workshops, and the railway station. The building of the hardware and fittings plant was built in 1900 and is located on R. Ilyashev Street, 45 (former Komintern St.) **(**Baytenov, 1985a), (Table 1).

Table 1- Characteristics of the surveyed objects

Name	Address	Date	Style	Source	Condition
Hardware and fittings factory building	Semipalatinsk, Ilyashev St., 45	1900	“Brick” style	Field survey	Fair
Pumping station building	Semipalatinsk, Cherepanova St., 1	1903	“Brick” style	Field survey	Good
Water tower building	Semipalatinsk, Cherepanov St., 12	Early 20th century	“Brick” style	Field survey	Good
O.F. Kostyurin’s mechanical workshops buildings	Ust-Kamenogorsk, Chekhov St., 45	1907	“Brick” style	Field survey	Good

Figure 2 – Hardware and fittings factory building (formerly Musin’s merchant mill), general view and plan (author’s material)

The merchant Musin's steam mill (Figure 2) ground floor from wheat, which was grown in the region in large quantities by the end of the 19th century. There are also warehouses for finished products. The building is brick, five-story, the main volume is rectangular in plan. The facade, oriented to Abay Street (formerly Sovetskaya Street), is symmetrical, three-part horizontally. The middle part, the widest in the center, has a two-step attic with a decorative overlay frame along the contour. The side parts are symmetrical, have a gable finial with a round attic window inscribed in the field of the gable. The parts are separated from each other by elongated window openings, covered with arches of a bow outline with archivolts protruding from the plane of the wall. The arches "rest" on decorative blades, which are read as their overhangs. The end facades are designed similarly to the side parts of the longitudinal facade,but are somewhat wider (they have three window openings in a row), the gable ends also have a rectangular crowning projection, a profiled cornice "supported" by a row of rising overhead brackets and a round window with a protruding frame, which has concentric-radial mullions. The corners of the building are marked by rusticated pilasters, the central and side parts of the main facade are separated from each other in the same way, and the corner ones continue above the roof in the form of square-plan hipped turrets with rectangular panels. The building has a crowning cornice of overhead decorative brackets. The building is designed in two

colors - the entire plane has a natural brick-red color of unplastered masonry, protruding details - pilasters, cornices, frames, etc. painted white, which looks very impressive and festive. Overall, against the backdrop of the historical urban fabric, the building appeared monumental, and its relatively "restrained" architecture, compared to religious and civic buildings, corresponded to its intended function within the framework of the "architectural language."

The building of the pumping station was built in 1903, is located on D. Cherepanov Street, 1 (formerly 9th January Street) (**Figure 2**) (**Baitenov, 1985b**). The brick building consists of 4 blocks, three rectangular interlocking blocks and a fourth octagonal block connected to them by a narrow passage. (**Figure 3**).

Figure 3 – Pumping station building, plan (author's material)

The first three blocks, located on one axis, have gable roofs covered with roofing iron (at the side ridges it coincides with the longitudinal axis, and at the middle higher one it is located across), the fourth volume is shifted and covered with a pyramidal 2-step roof. This already gives the building an expressive silhouette and originality.

The building's asymmetrical composition is based on the contrasting juxtaposition of the tall central section with the rest of the structure. The level of the low, one-story parts of the building creates a horizontal line of cornice rods, which is a unifying element of the composition. The dynamic combination of various geometric figures, which is the basis for the volumetric-spatial design of the building, is developed in the composition of the facades, in the architectural treatment of each of the volumes.

Both longitudinal facades are identical; the entrance is from the end of the building. The dominant in the composition is the middle, two-story volume, its composition consists of three vertical sections. The central volume is highlighted by blades and has a gable end, the blades are decorated with vertically elongated panels and protruding sections, the latter generally resemble stalactites. A pointed arch with a stepped archivolt "rests" on the inner part of the blades, filling the field of the gable and forming a niche in which there is an arched opening. The cornice of the gable repeats its outline and consists of brick crackers, the gable itself has a covering of roofing iron. The side sections repeat each other symmetrically, their corners are decorated with three-quarter square columns with panels and projections similar to those on the intermediate blades. These columns have an above-roof continuation in the form of square turrets with pyramidal ends and spires.

The windows of the first floor of the central volume are rectangular, above them are decorative "ribbons" of a row of bricks, facing the facade at an angle ("curb"). The windows of the second floor are decorated in a more complex way, they are covered with arched arches with projecting ar-

chivolts and stepped overhanging window sill cornices. The crowning cornice of the building, consisting of several overhanging rows of masonry, "rests" on a row of flattened brackets.

The side volumes have three window openings (some of them are bricked up), covered with arched arches with U-shaped projecting frames. The outer corners of the volumes are decorated with three-quarter square caps with the same in the central volume under the roof turrets.

The octagonal volume, through which the transition corridor connects with the side volume, has an entrance opening in the face on the opposite side, in the rest there are high window openings covered with arched arches. Above them runs an intermediate cornice in the form of a row of bricks, coming out at the corners onto the facade with a profiled thrust from a row of bricks above it, this cornice encircles the entire building - on the side volumes it is crowning, and on the central one - at the level of the second-floor window sills. The crowning cornice of the octagonal extension is simpler and consists of several rows of overhanging bricks. At the base of the building there is a protruding plinth.

Two buildings of mechanical workshops of O.F. Kostyurin, erected in the beginning of the 20th century, 1900-1907, in Ust-Kamenogorsk are located on Chekhov Street, 45 (former Kirov Street) (**Figure 4**). The building is made of brick, two-story, the facade overlooking the former Kirov Street, on the first and second floors has three window openings, on the first floor they are covered with bow arches with decorative archivolts having a protruding keystone, alternating protruding and recessed sections. The window openings of the second floor are rectangular in outline (the middle opening is wide, the side ones are narrow), above them there are three superimposed adjacent bow arches resting on decorative brick brackets, the middle arch is wider than the side ones and is located higher.

Figure 4 – Buildings of the mechanical workshops of O.F. Kostyurin (author's material)

Under the window openings there are panels with a round figure in the center. The building has an intermediate (between floors) and crowning cornices, the first is designed as a draft with a row of crackers along the bottom. The crowning cornice consists of a row of decorative brackets. At the corners there are pilasters that continue above the cornice, there is also an attic with two turrets in the center and a wall with a sagging crown between them. On both sides of the described volume there is an extension on each side. On the left side, the one-story extension has a window opening covered with a bow arch, facing Chekhov Street (former Kirov Street), the corner is decorated with a spatula. On the right side, the extension has an entrance opening, the second floor of the extension is wooden. The facade of the second building, facing Chekhov Street (former Kirov Street), in its architectural design resembles the facade of the Kostyurin mechanical workshops located nearby. However, there are differences.

The second building also has two floors, although there are no extensions. The first floor is plastered and whitewashed and has an entrance door with a semicircular overhead arch in the center, with two window openings on both sides of the door. The second floor also has two window openings, which are located in the central part of the facade surface and look like a large paired opening framed by a wide bow arch with brackets.

The placement of the buildings in the block is original. They face the front line of the street with their narrow end facades, and the buildings themselves go deep into the block, in the manner of medieval urban development. The front end facades are also original in architecture, typical of the architecture of the late 19th - early 20th centuries, with a search for new means of expression, giving the buildings a bright individuality. Along with those considered, the city has a number of engineering structures in the brick style, dating back to the late 19th - early 20th centuries. Of interest among them is the water tower (**Figure 5**) (**Baitenov, 1985 a**). The tower is majestic, externally reminiscent of the forms of medieval donjons, as it is crowned with battlements at the top and has a glacis (inclined surface) at the base. The structure has high quality workmanship and good proportions. In the nature of the surface design, the round outlines of the window openings anticipate the architectural features of industrial buildings, as well as the characteristic architectural details that characterize the stylistic features of the buildings of Semipalatinsk, made of brick.

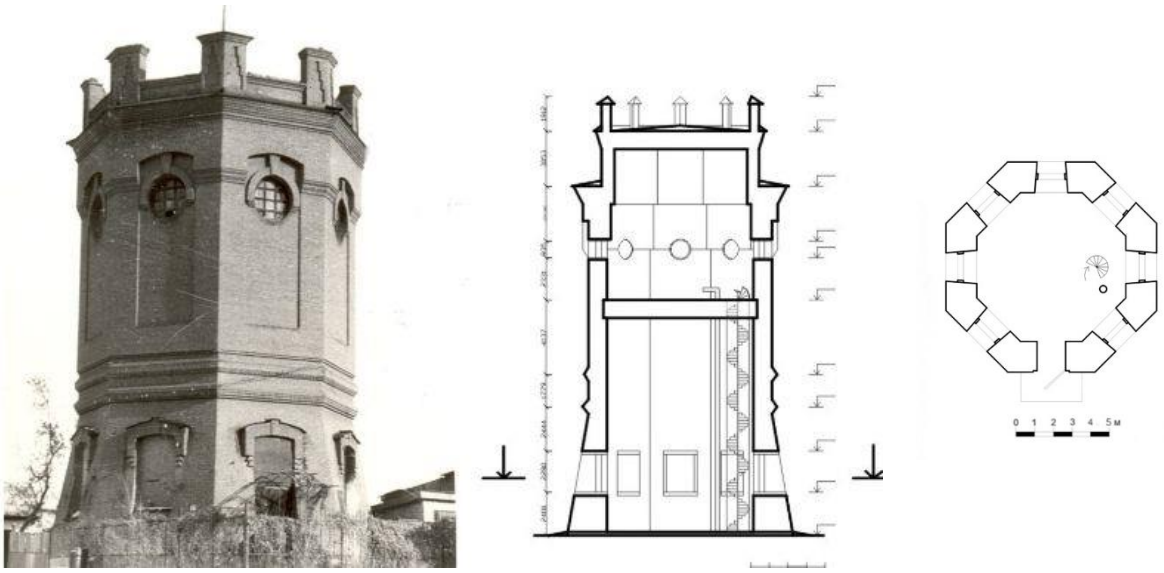


Figure 5 - Water tower building, plan, section (author's material)

The characteristic compositional features of the buildings under consideration are the symmetry of the facades or the symmetry of the sections that make up the facades; one can also note the "two-color" in the facade design, where the elements protruding from the plane of the wall ("active") are painted white, and the wall itself is painted another color, and this is observed both for monuments of the "brick" style (hardware and fittings plant), and for buildings with a classical artistic basis (branch of the Irtysh Hotel, literary and memorial museum named after Abay, etc.). In general, the "two-color" design of the facades complements the already pronounced tectonics of the facades. All this should be taken into account when repairing buildings and when choosing the color scheme for the facades of modern buildings, within the historical development for continuity in architecture.

So, as considered above, in general all the objects of industrial architecture were developed in the so called "Brick" and partially the Art Nouveau styles. The architects applied those styles on those objects to reach artistic image of high level of buildings. Moreover, they should have met requirements of their functional aspects. As compared with the buildings of civil architecture of that period, the objects of industrial architecture were in line with general architectural overwhelming style of that time though they had some features of "brutality". The architects had to create the de-

sign projects which met the requirements of their functions but they strictly followed the stylistics of the "Brick" and Art Nouveau styles. The influence of those architectural styles on those objects was prevailing and all the buildings of that period were made in the same stylistics, though they had diverse functions. In general, artistic image of the buildings was prevailing over their functionality.

4 CONCLUSIONS

In the formation of the industrial architecture of East Kazakhstan, the leading role was played by both the functional and planning requirements for specific production facilities and the general artistic and stylistic orientation of the era, expressed mainly in the use of the decorative and structural structure of the "brick style" facades with the use of individual elements of Art Nouveau. At the same time, in such a building as the pumping station in Semipalatinsk, an interpretation of the motif of perspective arches taken from the artistic system of "neo-Gothic" is visible (Isabaev, 2017).

1. In terms of planning, the presented objects of industrial architecture demonstrate a link to the functional orientation of the structures, with the convenience and rationality of technological factors. At the same time, certain professional sophistication and elegance in the interpretation of the composition relationships of the premises and the architecture of the facade planes can be traced here. An interesting urban planning technique is used in the spatial organization of O. Kostyurin's workshops in Ust-Kamenogorsk. The end facades of the two buildings, worked in facing fired brick with a complex decorative and artistic composition, overlook the front line of the development of the shopping street and bring their own special aesthetic accent to the panorama of the row development.

A special volumetric and compositional solution in the industrial architecture of this era was received by such seemingly utilitarian structures as water towers. Octagonal in plan, these types of buildings have a harmonious vertical architectural structure with the division of multifaceted facades by "blades" and rods.

2. In general, it should be noted that despite the utilitarian nature of industrial facilities in the region of the specified period, expressed in functional technological plans, significant emphasis was still placed on the architectural and artistic focus in the construction of industrial buildings, indicating that they were considered one of the leading ones in the formation of the urban appearance of the cities of Eastern Kazakhstan in the late 19th - early 20th centuries. The stylistic direction, despite the eclecticism and inclusions, sometimes even in an open form, of classical and other elements, nevertheless, is mainly subject to the canons of the "brick" style. This, as well as the absence of buildings in earlier styles (such as Classicism), was determined by socio-economic conditions — the rapid industrial development of cities by the late 19-th and early 20-th centuries, which created a demand primarily for the “brick” style as the most expressive of democratic tendencies.

3. Industrial architecture monuments were often distinguished by considerable size and a monumental appearance (e.g., the hardware and fittings factory) and were sometimes positioned as vertical dominants (e.g., the water tower). Even when they were more modest in scale (such as O. Kostyurin’s workshops), they still played a significant role as city-forming elements against the predominantly one- and two-story urban fabric.

Overall, in compositional and typological terms, industrial architecture objects, while following the general stylistic orientation of Semipalatinsk and Ust-Kamenogorsk, nevertheless allowed architects to create individual characteristics for each structure, with each building serving as a full-fledged bearer of the style.

Photos and the drawings of the buildings provided and handled by E.M. Baitenov, one of the authors of the paper.

REFERENCES

1. **Yanushkevich A.** (1984) Diaries and letters from a trip to the Kyrgyz steppes A. Yanushkevich - Alma-Ata. – Publishing house “Nauka” KazSSR p. 6 [Dnevniki i pis'ma iz

puteshestviya po kirgizskim stepyam] (In Russ.)
2. **Semipalatinsk**. (1984) – Alma-Ata. – Publishing house “Kazakhstan” p. 224 (In Russ.)
3. **Baitenov E.M.** (1985a) Report on the research work "Study of the housing stock of old cities of Kazakhstan". “Housing stock of old cities of Kazakhstan”. “Semipalatinsk”. – Alma-Ata, p. 61–69 [Otchet o nauchno-issledovatel'skoy rabote «Issledovanie domovogo fonda starykh gorodov Kazakhstana». «Domovoy fond starykh gorodov Kazakhstana». «Semipalatinsk»]. (In Russ.)
4. **Baitenov E.M.** (1985b) Report on the research work "Study of the housing stock of old cities of Kazakhstan". “Housing stock of old cities of Kazakhstan”. “Ust-Kamenogorsk”. – Alma-Ata, p. 48 [Otchet o nauchno-issledovatel'skoy rabote «Issledovanie domovogo fonda starykh gorodov Kazakhstana». «Domovoy fond starykh gorodov Kazakhstana». «Ust'-Kamenogorsk»]. (In Russ.)
5. **Palass P.S.** (2000) Diaries and letters from a journey through the Kazakh steppes – Almaty, p. 62 [Dnevniki i pis'ma iz puteshestviya po kazakhskim stepyam]. (In Russ.)
6. **Gaines A.K.** (2004) Kyrgyz Sketches // Military Collection – No. 6 publishing house “San-at”, p. 74 [Kirgizskie ocherki]. (In Russ.)
7. **Finsch O., Brem A.** (1982) Journey to Western Siberia Moscow: Printing house M.N. Lavrova & Co” p.185 [Puteshestvie v Zapadnuyu Sibir']. (In Russ.)
8. **Baitenov E.M.** (2004) Memorial Architecture of Kazakhstan: Evolution and Problems of Form Development. – Almaty: Publishing House "Bilim." p. 43. [Memorial'noe zodchestvo Kazakhstana: evolyutsiya i problemy formoobrazovaniya]. (In Russ.)
9. **Kozlov M.V.** (2000) Problems of Preserving the Historical Heritage of the City of Ust-Kamenogorsk. Delovoy Ust-Kamenogorsk, No. 3. [Problemy sokhraneniya istoricheskogo naslediya goroda Ust-Kamenogorska]. (In Russ.)
10. **Kashlyak V.N. (2004)** Churches of Semipalatinsk: Past and Present. Semipalatinsk, p. 610. [Khramy Semipalatinska: proshloye i nastoyashcheye]. (In Russ.)
11. **Larionov M.M. (2006)** Orthodoxy in the Architecture and History of Eastern Kazakhstan. Ust-Kamenogorsk, p.112. [Pravoslaviye v arkhitekture i istorii Vostochnogo Kazakhstana]. (In Russ.)
12. **Espenbet A.S.** (2010) Architectural and Artistic Features of Urban Architecture in Eastern Kazakhstan (19th – early 20th centuries). PhD diss. in architecture, 18.00.01 – Almaty. Chapter 2 p.68. [Arkhitekturno-khudozhestvennye osobennosti gorodskogo zodchestva Vostochnogo Kazakhstana (XIX – nachala XX v.)]. (In Russ.
13. **Isabayev G.A.** (2017) Stylistic Features of Architecture in Kazakhstan in the Second Half of the 19th – Early 20th Centuries. – Almaty: Zhibek Zholy Publishing House p.137. [Stilevye osobennosti arkhitektury Kazakhstana vtoroy poloviny XIX – nachala XX v.]. (In Russ.)
14. **Baitenov E.M., Espenbet A.S. (2024)** Architecture of Eastern Kazakhstan (using the example of the historical heritage of Ust-Kamenogorsk city). *Khabarshy–Vestnik KazGASA*, No. 4 (94), pp. 24–38. DOI 10.51488/1680-080X/2024.4-02. (In Russ.)
15. **Baitenov E.M., Espenbet A.S. (2024)** “Stone” Mosques of Eastern Kazakhstan: On the Issue of Sources for Contemporary Regional Architecture. *Vestnik VKTU im. D. Serikbayev*, No. 4, pp. 216–227. DOI 10.51885/1561-4212. In Russ.).