

The Global and the Local in the Architectural Formation of Former Port Territories

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ABSTRACT

The formation of the architectural typology of a building is a secondary and long-term process in relation to the development of new technologies. A building or a structure does not have time to change according to a certain algorithm in step with technological progress. Even more questions arise if we speak about vast territories connected by a single technological process. In the practice of architectural and urban planning adaptation of industrial enterprises to a new function, the topic of modern use of the territories of former ports and harbors has its specifics. The features of their architecture, by definition, were dictated not only by the peculiarities of a particular city, but also by its relationship with other cities, since ports are both gates and nodes of a communicative framework, the basis of which is influenced by them. The general and local features in the architectural formation of the former port territories are revealed on the basis of identifying the functional, structural, compositional and artistic features of their current development. The topic is considered on the example of the Hanseatic Embankment in Bruggen, the old harbor in Genoa, the Docklands district in London, HafenCity in Hamburg, the Media Port in Dusseldorf, the Strelka in Nizhny Novgorod. The article is accompanied by the author's photos.

Keywords: Architectural formation, Port, Building, Structure, Public space.

1. INTRODUCTION

In the extensive practice of architectural and urban planning adaptation of industrial enterprises to a new function, the topic of modern use of the territories of former ports and harbors stands out among others. The Docklands area in London, the Media Port in Dusseldorf, the old harbour in Genoa, the Bruggen embankment in Bergen, Norway – this is not a complete list of well-known examples that illustrate different versions of today's existence of those once closed objects. Moreover, by saying "closed", we can confidently refute ourselves: exactly the sea and river ports opened those cities to the world, many of which were part of the Hanseatic League that existed for centuries – from the middle of the 12th to the middle of the 18th century. Ports were the gateway to those cities and set the specifics of the communication framework of Europe, being its nodes.

"The Hansa was built on the matrix principle with minimal hierarchy within the system... The matrix principle gave stability to the entire structure, even in the changing composition of the Hanseatic League. The entry into or exit from the Hansa of several cities did not violate the overall stability of the system... Control over new territories was never at the center of the Hansa's efforts. Maintaining control over the lines of sea and river communications was much more important for the member cities of the union" [1].

Analyzing the changing impact of urban systems on global shipping networks, César Ducruet refers to an essay by Anne Bretagnol in 2015, which identifies three successive stages of reducing the role of marine flows for urban development [2]:

The first stage of the 13th–18th centuries was characterized by weak links between cities and the crucial role of maritime transport in urban development;

The second stage of the 19th – mid – 20th century was characterized by strong links between cities, while water transport was combined with rail and road transport, giving rise to numerous world gateway cities;

The third stage – the second half of the 20th century to the present time is characterized by the emergence of spatial and functional models of the division of port cities: the transfer of port facilities from urban centers to deeper water areas on the outskirts of cities.

Port technologies were also changing: ships and barges became larger, and in the 1950s sea trade switched to large container ships. This led to the fact that in the 1960s, many cities began a step-by-step reconstruction of the port territories, the central location of which, as well as their compositional and semantic role in the formation of the embankments of port cities as their main facades, turned it into a serious urban planning task.

2. PORT-FACADE: HANSEATIC EMBANKMENT IN BERGEN

Bergen, a city in northwestern Norway, was part of the Hanseatic League from 1350 and was one of

its most important centers in northern Scandinavia. The medieval embankment of Bruggen – a UNESCO cultural heritage site – is the sea facade of a recognizable silhouette of continuous gable roofs ("Figure 1"). 17 narrow (3-4 light axes) 3-storey wooden brightly painted facades overlook the embankment. The color scheme: white, yellow ochre and red ochre – gives the northern landscape a southern warmth. The old Bergen dockyard has retained its rectangular layout structure with narrow streets. Many wooden houses burned down, currently 58 buildings survived. These are gallery houses with high attic floors. The functional solution of the houses included retail premises on the lower floors and housing for clerks – on the upper ones, now the block is uninhabited. It houses the premises for the administration of the museum, souvenir shops and cafes. A whimsical mixture of preserved, carefully restored structures and frank new designs creates a kind of carnival environment typical for medieval business centers, when the business function was forced to "hide" behind a fairground fun or a balagan, and the trade deal acted as a secret [3].



Figure 1 Hanseatic Embankment in Bergen.

3. PORT-CITY: HAFENCITY IN HAMBURG

Twenty years ago, the HafenCity area in Hamburg was an active port, whose facilities were very outdated, and whose "spot" on the general plan of the city became too small for the versatile functions of a modern port. It was decided to build a new terminal for large vessels, and in the early 2000s the port was finally moved to the western part of the city.

Hamburg is one of three cities (along with Lübeck and Bremen) that remained in the Hanseatic League until its final dissolution in 1862. In 1871, the city became part of the German Empire, but the desire to preserve economic privileges dictated the need to develop a separate free trade area along the banks of the Elbe – a city within a city. For this purpose, from 1883 to 1927, the Speicherstadt port warehouse complex was built on the river canals, which was included in the UNESCO World Heritage List in 2015. Built on oak piles on the site of demolished residential buildings of the 16th – 18th centuries, Speicherstadt cut off the autonomous port area from the city center, in view of which it was located, with a dense two-, three-layer wall. Despite its central location, this part of the city, where the unloading, loading and customs inspection of merchant ships took place, was closed to access. The warehouses fixed up a multi-layered linear planning structure, historically assigned to this place by the canals. One of their facades faced the street, the opposite looked out on the canal, in this there was a continuity in relation to the demolished civilian buildings.

Red-brick 6-7-storey warehouse buildings, addressing the neo-Gothic style, have a prefabricated steel frame [4]. During the World War I, some of the warehouses were destroyed. They were restored using the preserved fragments. The objects built after the World War I in the 1920s, no longer bear the features of neo-Gothic architecture. However, even today, it is this style that largely sets the scale, character, and sometimes dictates the artistic image of the district as a whole. It is peculiar that until now, part of the premises of the old warehouses is used for its direct functional purpose – for storing individual goods.

The entire post-war period Hamburg, the city on the river, developed "from the center to the periphery" and literally "turned away" from the Elbe flowing through it. When the territory of the abandoned harbor was given over to the

construction of a new urban complex, this situation changed dramatically. Now, water is organically included in the urban planning context, and has acquired a new quality, becoming an essential factor in determining the attractiveness of the place and the buildings located on it. The concept of the modern HafenCity is based on the principle of openness and integration into the life and appearance of Hamburg.

The idea to transform the outskirts of the port in Hamburg appeared in the 1990s. The first study on urban regeneration of the periphery of the port area was conducted by the famous architect, Professor V. Marg. The vision of HafenCity was presented in the spring of 1997. At that stage, the regeneration concerned only relatively narrow areas on the river bank and included, first of all, the restoration of the Elbe embankment in Altona [5].

The competition for the urban planning concept of HafenCity was held in 1999. The area of about 157 hectares was supposed to turn into a prestigious urban area with mixed use – housing, work, and recreation. At the same time, it was not about creating a large residential area on the periphery or a satellite city, but about expanding the historically established central core with a developed infrastructure. The winner was a joint project of architectural bureaus "Hamburgplan" and Kees Christiaanse / ASTOC. The architectural and planning concept of the new district is based on the idea of maximum preservation of the natural and historical and cultural features of the territory, the "spirit of the place", on the one hand, and the introduction of socio-economic significance into it – on the other. The characteristic topography of the place – the canals cutting through the land, the narrow long "tongues" of the former historical harbors and the outlines of the embankments, the "marine" character of the area as a whole – all this is reflected in the project.

The Masterplan laid down a number of basic principles for the development of the territory:

- the economic principle of phasing, ensuring rational financing and development of the territory; the development of the HafenCity district is proceeding in stages and progresses quarterly both along the west-east longitudinal axis and in the direction of the historic Speicherstadt warehouse district;
- the urban planning principle – interaction with the historical center of the city – creating an architectural environment that

- is organic to the existing built up area of Hamburg;
- the principle of limiting the number of storeys – the space-planning principle – medium rise of buildings – 6-7 floors, the height of dominant – 11-12 floors;
- the principle of multiple use of the territory: subway, freight transport, underground parking lots, engineering utilities, warehouses; surface driveways and urban transport; flood protection is of particular importance for construction in this region [6], all buildings and streets are raised to a height of 7.5 m above the sea level;
- multifunctional development in general and each building in particular - the functional concept of the complex is based on the idea of the viability of this part of the city, which is realized through the creation of institutions of culture, education, leisure, trade, food, service, as well as connecting public spaces.

The nature of the planning structure is dictated by an extended west-east longitudinal axis and several cross bridges that connect the HafenCity area with the city center ("Figure 2").



Figure 2 HafenCity in Hamburg.

Urban planning and semantic dominant (H = 110 m) is the building of the Philharmonic Hall on the Elbe, arch. Herzog & de Meuron, 2007-2017 – a multifunctional complex with a total area of 120,000 m² with two concert halls, a hotel with 2.5 thousand rooms, offices, apartments and an observation deck. The podium for the Philharmonic Hall is a cultural heritage site – the old brick warehouse Kaispeicher A, arch. W. Kallmorgen, 1965, originally used for storing coffee and cocoa beans [7]. During the reconstruction of the architectural monument, minimal interference with its structure was assumed, i.e. the organization of the function inside without disturbing the external appearance. A sloping tunnel with a long escalator cuts through several floors of the parking lot and lifts visitors to the open observation terrace – plaza. From here, from the observation deck between the lower (historical) and upper volumes, it offers, on

the one hand, a view of the port and, on the other hand, the panorama of the city. At this mark, the three-dimensional design of the organization of the internal space is also read as much as possible – the porosity, the permeability of interiors, the idea of flowing spaces [8].

The undulating outline of the roof of the Philharmonic Hall on the Elbe is probably the only clearly articulated method of sea associations in the appearance of a building in HafenCity. It looks like transparent waves, "breaking" on the impregnable red-brick podiums of the port, freeze in immobility at its "gate". In general, the romance of long-distance travel and the aesthetics of sea liners are not directly read in the artistic image of the objects of HafenCity. The city-port, the city on the water is a common semantic and compositional-artistic theme that unites all approaches to the urban

planning solution of the district as a whole and each building in particular.

4. MEDIA PORT IN DUSSELDORF

The industrial and commercial port of Dusseldorf was opened officially in 1896 on a picturesque peninsula south of the historic core of the city and was considered one of the most modern ports in Europe, primarily due to mechanization and electrical equipment. The port played a major role in forming the economy of Dusseldorf, supplying the city with food and industrial goods, as well as construction materials, mainly wood.

The place received the name of the Media Port, Media Harbor, after the construction of the Rheinturm TV tower (arch. H. Diman, 1981). In addition to the dominant function of television and radio broadcasting, the Rhine Tower comprises a number of related functions, including, first of all, leisure and entertainment. Three levels of the tower are open to visitors: at the 180 m mark there is a revolving restaurant, at the next level – a cafeteria, above – an observation deck with views of the city and the Media Port area. The Bilk Landscape Park is located around the tower, where autonomous architectural objects are located like islands. The Art Park was designed by landscape architect Georg Penker, who treated it as artificial jungle.

An open "labyrinth" of plant sculptural forms leads to the building of the "City Gate" of Dusseldorf (arch. Overdick, Pecinka and partners 1992 – 1998). These are two towers of the bureau, connected by three upper floors as a bridge. In plan, the structure is a parallelogram with sides of 66 x 50 m. The corresponding urban planning position – at the entrance to the Media Port – dictated the shape and compositional role of the object.

The quarter of the New Customs (architect F. Gehry, 1996-1999) is an ensemble of three buildings-sculptures. The name was given because historically the old customs office of the Dusseldorf port was located on this site. The artistic idea of the New Customs ensemble is a "family" of three related objects: large objects-parents of white and red colour (at the edges) are reflected in the mirror silver surface of the object-child (in the middle). The complex sculptural form is also enriched with an idea of terracing: each of the three buildings are of different height. Additional revolving moment is achieved by the window blocks in the boxes, directed at different angles to the wall surface. As a result, the buildings seem to spin to the rhythm of

jazz or swing. A viewer also circles together with them, bypassing the object from all sides.

An embankment runs along the bay from the buildings of the New Customs House, under it there is a transport tunnel that stretches along the bank of the Rhine for almost 2 km. Three more streets parallel to the embankment are built up densely with both reconstructed and new structures. Protected by the state, red-brick monuments of industrial architecture of the end of the last century alternate with glass modern buildings. In the forms of the latter, one can feel associations with ships that have entered the port. Such a building is the Grand Bateau European Media Institute, arch. C. Vasconi. This is a linear composition of two volumes, facing the facades of parallel streets. One of the structures – a granite prism with ribbon windows – symbolizes the pier. The second one, transparent and curved, is a docked ship with tectonically exposed decks.

Two sides of the bay are built up with architecturally contrasting buildings. The "breakwater" between them is the Port Event Center building with an overhanging "Air Iron" (arch. N.Wansleben, 2002). The red house with a gable roof, a rehabilitated object of historical heritage, is used as a disco club.

On the other side of the bay there is a firewall built up area of multi-time and multi-character buildings ("Figure 3"). Its dominant feature is the 17-story Colorium business center, arch. V. Alsop, 2001. The strict prismatic construction has similarly designed glass facades. Their frontal composition addresses the pixel structure of a computer image. Other associations is Lego constructor: multi-colored components are assembled in a system and are combined with a maroon volume of the helipad. This element, protruding towards the river on the cantilevers, at night is illuminated from the inside and turns into a glowing object hovering over the river [9].



Figure 3 Media Port in Dusseldorf.

Picturesqueness of the neighboring buildings is achieved by a combination of reconstructed and newly erected objects. Deliberate diversity gives strict buildings with business function the appearance of amateur construction. According to this principle, a four-part complex is being built, designed by architect A. Priolo. The Marriott Hotel's modern building is adjacent to a brick building of a former barn, built in 1938, which is a cultural heritage site and is currently being renovated as a bureau. In contrast to the elegant structure of the villa, to the north, it is adjacent to the former storage room, adapted as a Media center. The facades were accomplished with rather stingy means, retaining the ribbon glazing and the metric series of pilasters and horizontal belts typical for industrial architecture. Their unique artistic appearance is created by "climbing" on the vertical plane colorful pinniped figures (artist Rosalie).

5. THE PORT – BUSINESS CENTER. DOCKLANDS IN LONDON

Let's turn to the Docklands area in London. This area of docks along the Thames consists of separate satellite cities of London, connected by railway transport. For a number of years, it has been undergoing a comprehensive reconstruction as a multifunctional business center. The main object of this large urban development is Canary Wharf ("Figure 4"). It is this place that has now become the main new business district of London. It includes approximately 1.3 million m² of office space for various companies, banks, large shopping centers and representative offices, restaurants, clubs and other related institutions and premises that provide conditions for work, which is transformed here into a way of life [10].



Figure 4 Canary Wharf in London.

Buildings of the business centers of Canary Wharf, designed by architectural firms Skidmore Owings Merrill, Kohn Pedersen Fox, Cesar Pelli and associates, the HAWK-International are united in a dynamic composition with a pronounced center in the form of a tower with a pyramidal roof. It is flanked by two almost equal-sized prisms, the main entrance is marked by a 4-story building turned into a majestic 10-column portico. Such an arrangement, as well as elements of landscaping: free-standing colonnades, fountains, sculptural groups, exits from the subway station (arch. Norman Foster and Partners, 1999), give the object a representative, even "palace-like" character. The view of Canary Wharf from the river is the symbol of the British business world.

6. THE PORT – LEISURE CENTER: OLD HARBOUR IN GENOA

The project of restoration and reconstruction of the old port of Genoa was carried out by Renzo Piano in 2001 ("Figure 5"). To create a significant public space, historical buildings were restored, new objects appeared – the Genoese Aquarium, harbor offices, the Biosphere Botanical Garden – a glass ball of 20 m in diameter, a restaurant. The observation elevator is part of the ensemble of the embankment improvement, the style of which is determined by the signs-symbols of the Ligurian coast – pulled sails, lifting mechanisms, blocks and cables, masts and frames. The panoramic elevator gives a wide view of the entire sea port. Its cylindrical cabin is suspended from a stretchable Bigo structure, whose metal beams, held together by a system of thin cables, diverge in the form of the crown of a giant palm tree.



Figure 5 Old harbour in Genoa.

7. PORT-RECREATION. STRELKA IN NIZHNY NOVGOROD

Strelka is a key location for Nizhny Novgorod. Everything has come together here: Nature, History, Society, Man. The sublime and the earthly: the cult – the Alexander Nevsky Cathedral – and the port of the largest Soviet city with factories – giants of industry [11]. Initially, the confluence of two beautiful rivers played a pronounced communicative role. Emphasizing the natural and historical features of the city, the Strelka is endowed with an important urban planning, semantic and symbolic meaning, it forms river panoramas of the Zarechnaya part, viewed from

above from the viewpoints of the Upland part ("Figure 6").

From 1817 to 1930, the territory belonged to the Nizhny Novgorod Fair – the largest shopping complex in Russia, which was formed over a hundred years as a complex multifunctional center, which included shopping, administrative, hotel, religious, social and entertainment, warehouse buildings and structures. It was a holistic urban planning formation. The dominant position on the Strelka was occupied by the Alexander Nevsky Cathedral, which was built in 1881 in the center of the fair square at the end of one of the main streets of the fair – Alexander Nevsky Street, which ran

along the bank of the Oka River. After the official liquidation of the Nizhny Novgorod Fair in 1930, along with the destruction of the architectural

ensemble of the fair, the planning structure of the square around the Cathedral was almost completely destroyed.



Figure 6 Strelka Volga and Oka in Nizhny Novgorod.

A significant part of the square turned out to be located on the territory of the cargo river port, which was located there since 1932, and was cut off from the cathedral by a blind fence. The semantic, figurative and typological intersection, the place where streams and people meet, which cannot be considered in isolation from the urban spaces, directly and visually adjacent to it, at the same time has long been autonomous, closed to access. After the port was removed in 2015, there was still no access to the territory, and it seemed abandoned and deserted.

In 2015, the openwork metal structures of warehouses along the Volga River were identified as the structures of the central pavilion of the 16 All-Russian Industrial and Art Exhibition of 1896 in Nizhny Novgorod, moved here from the 15 All-Russian Industrial Exhibition of 1882 in Moscow. These load-bearing metal frames were designed by some of the best engineers in the country – G.E. Pauker and I.A. Vyshnegradsky. "The unique designs on the Strelka represent a special value. They have absorbed the forgotten, or, more correctly, the unknown to us engineering culture that developed in the middle of the 19th century" [12]. Currently, the structures are classified as newly identified objects of cultural heritage, released from the enclosing walls and opened in their entirety.

In 2018, a football stadium for 45 thousand spectators was built on Strelka (DI US "Arena", project 2013). Since then, public attention has been focused on this place.

Currently, the Institute for the Development of the Urban Environment of the Nizhny Novgorod Region has developed a concept of temporary

improvement of the Strelka's territory, which interprets it as an open public space – a multifunctional park. The compositional solution of the recreational space is determined by two embankments – Volzhskaya and Okskaya, which set the direction of the territory. The improvement system facing the Oka River is of a regular anthropogenic nature, since the embankment offers views of the city. And that developing along the Volga River and addressing the trans-Volga distances is more picturesque. Thus, in this case, the former port territory is treated as a recreation area.

8. CONCLUSION

Water – river, sea, ocean – have always been unifying elements in business contacts. In the world civilization, the city arose, as a rule, on the water and genetically perceived its dictate. From this point of view, cities on the water are similar, and their architectural environment is formed according to common laws. The architectural formation of the former port territories reflects these general patterns, while at the same time having local features for each city. Such a statement allows drawing the following conclusions:

1. Common features in the architectural formation of the former port territories:

- the connection of urban planning and compositional solutions remains with the water area;
- the relationship and interaction with the historical center of the city, the maximum exclusion of contradictions between

innovations and traditions of the historical development;

- the important role of engineering structures related to coastal protection, geology and hydrogeology;
- the improvement system synthesizes the solution of rational engineering and socially significant tasks – formation of popular public spaces.

2. The local in the architectural formation of the former port territories:

- different typological "dominants" in the architectural formation of the former port territories: port-facade, port-city, media-port, port-BC, port-recreation;
- former port territories are formed either independently - as separate enclaves, or as incorporated into the historical center of the city, its integral part;
- a different functional program with a general multifunctionality;
- an individual approach to the figurative solution: architecture is based on natural images, on associations with ships, on the use of analogues of historical buildings, on a combination of tradition and innovation.

3. Transition to the "third quality" - synthesis of the general and the local:

- a holistic spatial model of the development of the generic communicative function in time without losing the "spirit of place" and time;
- the material embodiment of the synthesis of nature and history: natural and anthropogenic principles merged into a kind of natural-anthropogenic hybrid;
- cities become connected to each other outside the port territories.

AUTHORS' CONTRIBUTIONS

This paper is independently completed by Anna Gelfond.

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