

# Areas of sustainable development in island districts of Saint Petersburg

**M A Granstrem**

Saint Petersburg State University of Architecture and Civil Engineering, 4, Vtoraya Krasnoarmeyskaya Street, Saint Petersburg, 190005, Russia

E-mail: arch\_project@bk.ru

**Abstract.** At the current period which is characterized by aggressive introduction of capital into the historic center of Saint Petersburg, without scientific concept which establishes the integrity of the historical environment, it is impossible to ensure preservation of the historic city as a whole. This justifies the need to create a methodological framework defining the factors of establishing and preservation of historical buildings. The subject of research is the specificity of ribbon buildings of Vasilyevsky Island and Petrogradskaya Side as one of the most important components of historic Saint Petersburg architectural environment which has remained until today. The object of the research is the territories of sustainable development as elements of historical architectural and planning environment which was formed by ribbon (background) buildings of the main island districts of Saint Petersburg.

## 1. Introduction

The reconstruction of the historical city space has the adaptation of the established environment to modern needs as its ultimate purpose (while preserving unique characteristics of the urban space). All types of reconstruction activities performed within the historical city center should not affect the perception of city-forming ensembles and panoramas or violate the historical profile of the environment-forming development. Preserving both the spatial composition of the entire city and perception of historical streets and unique inner-block spaces is one of the main conditions for reconstruction. Improvement of the environmental comfort in a historical city should not result in the loss of existing historical morphotypes and changes in the initial development structure. This justifies the need for the establishment of a methodological framework determining factors to form and preserve the historically established development.

To cope with that task, it is required to define typological characteristics of development in their historical dynamics, identify the logic behind the formation and evolution of historical development to proceed with that logic in the modern context. In order to justify preserving each valuable fragment of development, it seems necessary to identify components of the integral environment, "threaded" onto the historical planning framework, trace the genesis of the owner's land as a structural element of urban development, define the environment-forming aspect of historical industrial areas. This paper overviews the development of island districts of Saint Petersburg in this context.



## 2. Materials and methods

Natural and archival surveys, analysis of historical cartographic materials were used as methods for this study.

## 3. The study of the structure of the modified lead-tin-base bronze

The modern layout of the Petrogradskaya Side can be perfectly laid over the historic layout that emerged in the second half of the 18th century. This is evidenced by the axonometric Sieghem Plan of 1738. The Sieghem Plan shows that the Petrogradskaya Side had extremely heterogeneous development (see Figure 1). In the very center of Peterburgsky Island, regular planning formed mainly by settlements of military and tradespeople can be seen.

The routes of Bolshoy Prospekt (former settlement of the Koporsky Regiment) and Vvedenskaya Street (Vtoraya Bolshaya Bilozerskaya Street) are laid out in the plan; a route of Bolshaya Pushkarskaya Street is set out. At the intersection of future Vvedenskaya Street and Bolshaya Pushkarskaya Street, the Church of the Presentation of Mary (which is now gone) is already built. Here, two types of planning meet: a layout with an orthogonal grid of streets from the south-east, and a layout dominated by contours of the Crownwork from the north-west. Modern streets — Sytninskaya, Kropotkina, Voskova (historically, Nalishnyaya Bilozerskaya, Bolshaya Bilozerskaya, and Malaya Bilozerskaya, respectively) — are directed almost in parallel to the Crownwork. In the plan of 1738, the formation of a radial network of streets directed towards the Peter and Paul Fortress can be seen in that part of the island. Developed and undeveloped areas alternate and are in close proximity to each other.



**Figure 1.** Fragment of the axonometric Sieghem Plan (1738), (north is at the foot)

The development in the areas within the triangle formed by modern Voskova Street and Bolshaya Pushkarskaya Street is far less dense. It is quite chaotic and more typical for the suburbs than for the capital city. Here, non-parallel short streets typical for the Petrogradskaya Side (not laid out yet in the Sieghem Plan) will be drawn in the future.

The layout gives a comprehensive idea of development phasing since it shows areas of the existing

city fabric neighboring with new, undeveloped territories. In her paper addressing the planning structure of the Petrogradskaya Side in the first third of the 18th century, O. V. Kefala analyzed the continuity of such a planning structure [1].

The genesis of the owner's land as a structural element of the environment-forming development can be traced by comparing the areas in the axonometric Siegheim Plan with the owner's land depicted in later maps of Saint Petersburg (e.g. the Detailed Plan of Saint Petersburg of 1828 compiled by Major General Schubert) [2]. Owner's land plots — distinct in proportions and characterized by large sizes — are primarily represented by areas owned by state and public institutions. Plots owned by churches and parishes come second in terms of size. Starting from 1738, it is possible to trace an increase in the number of large plots. However, it is not due to the merger of several small ones, but due to the appearance of new land plots in the territories undeveloped earlier.

Thus, the genesis of the owner's land depended directly on the layout that, according to the studies of historical maps as of the beginning of the 18th century, had different forms in different Saint Petersburg districts. A rectangular, expressly geometric grid of streets (lines) and avenues (prospekts) crossing them served as a basis for the Vasilyevskaya part [3], except for its eastern end where the city-forming ensemble of the Spit was created later. One of the features typical only for Vasilyevsky Island was to arrange for stone buildings (stepped housing development in plan view) following the contours of the shoreline in the western section of the Bolshaya Neva embankment.

According to the analysis of the territorial development intensity in various areas, the housing development on the Petrogradskaya Side was sort of fragmentary. This is particularly evident in comparison with the environment-forming development of Vasilyevsky Island, almost established by 1762 (in 1767, a plan to divide Vasilyevsky Island into a city part, outskirts and suburbs was approved. The boundary of the city was established between the 12th and 13th lines) and restricted by the Neva embankment in the south, Malaya Pershppektiva (avenue) in the north, 2nd line in the east and 13th line in the west [4]. The owner's lands on the Petrogradskaya Side were distinguished by lesser sizes conditioned by smaller sections of the street network, as well as by more free configuration.

The enlargement of the plot structure due to the allocation of new plots to state and public institutions in the best territories of the islands, i.e. near the embankments running to the Spit (on Vasilyevsky Island) and the Peter and Paul Fortress (on Peterburgsky Island) is a common trend for both islands. Large land plots used for production needs were located on the outskirts of the islands, mainly along the shorelines, in undeveloped territories. Lands owned by private persons and located in the central parts of the islands, intended for industrial production, became larger due to the purchase of neighboring plots. The symbiosis of industrial and residential areas is more frequently observed on the Petrogradskaya Side than on Vasilyevsky Island [5]. Residential and industrial areas are dispersed along the banks of smaller rivers, namely, Karpovka, Zhdanovka, Malaya Nevka, and Smolenka. At the beginning of the 20th century, residential areas appeared in the western part of the Petrogradskaya Side. They closely approached the territories of historical industrial areas (e.g. Lenina Street (originally, Shirokaya Street) closely approached the territories of a gas works). We should also mention areas where, in the 1910s, industrial buildings penetrated the living environment (e.g. the complex of the Printing Yard restricted by Oraniyenbaumsкая Street, Chkalovsky Prospekt (former Geslerovsky Pereulok) and Lakhtinskaya Street. It is required to analyze this phenomenon to ensure the sustainable development of territories and revitalize depressed areas.

The location of industrial buildings on the Petrogradskaya Side was conditioned historically. Several territories of sustainable development can be distinguished: an area where artisans and workers' settlements were located (where guns and coins were manufactured) and an area where regiment settlements were located, i.e. along the banks of Zhdanovka and Malaya Nevka, at the historical site of gunpowder factories, on Petrovsky Island. The monuments of industrial architecture are still located there, playing a significant environment-forming role. Unfortunately, the major portion of historical industrial areas located in the north-west of Peterburgsky Island, representing an element of the background development, is gone. Nevertheless, industrial facilities of the Petrogradskaya Side (unlike the monuments of Vasilyevsky Island) represent dominants and strong

compositional accents rather than environment-forming elements. Such facilities include two unique monuments of industrial architecture built during the Constructivism period, or local sustainability units: Petrogradsky bakery plant and a power station of the Krasnoe Znamya factory [6].

Krümmel garage — another piece of avant-garde architecture on the Petrogradskaya Side — can be included in the same group as well. Unfortunately, we should state the obvious: the unique facility is gone. After reconstruction, its original proportions were changed, and another floor was added. However, not only the volumetric and spatial solution changed. The facades built in the functionalism style now have ridiculous decorations — pilasters and profiled cornices.

The areas of sustainable development located on the Petrogradskaya Side are scarcely related to the existing dominants. However, another influence can be observed in details of the area boundaries, namely, the impact of the lost dominants. For instance, areas of the authentic environment with a fine grid of streets, established by 1738 (see the Sieghelm Plan), that appeared at the site of historical garrison settlements, differ in their structure and nature depending on their location relative to various lost churches. Based on that feature, several areas of sustainable development can be distinguished:

1. A territory formed around the former Saviour Transfiguration Koltovskaya Church (least authentic, most incomplete; with discordant elements). Nevertheless, the housing development in its south-eastern part, built by the beginning of the 20th century, is rather complete.

2. A territory formed by the 1910s around the former Matveyevskaya Church — from the Kamennostrovky Prospekt to Shamsheva Street, along Lenina Street (former Shirokaya Street) — preserved the characteristics peculiar to it as of the end of the 19th century – beginning of the 20th century, including an area restricted by Pushkarsky Pereulok, Kropotkina Street, Kronverkskaya Street and Lenina Street where a large office building was erected in 2014, completing the perspective.

3. At the site where, at the beginning of the 18th century, garrison regiments were located (Koporsky (from Shamsheva Street to Shirokaya Street, between Bolshoy Prospekt and Maly Prospekt), Sankt-Peterburgsky (from Shirokaya Street to Kamennostrovsky Prospekt, between Bolshoy Prospekt and Chkalovsky Prospekt)), an area of sustainable development can be distinguished, including minimum three morphotypes of historical development:

- Continuous fire wall development of the end of the 19th century – beginning of the 20th century (primarily: modern and neoclassical architecture).

- Fire wall development, historically incomplete due to various reasons. These are primarily open fire walls typical for Saint Petersburg, and, in most cases — entire complexes of fire walls creating the unique Saint Petersburg environment. Currently, this phenomenon of the environment-forming development is in danger of disappearance, as some investors are interested in so-called "lacunas" in historical territories.

- Individual buildings forming the development frontage (manor-type) — with spacing.

4. The area of the lost Vvedenskaya Church that formed the territory of garrison regiments can be designated as the central spot of the sustainable development area at sections of Bolshaya Pushkarskaya Street and Vvedenskaya Street.

5. The environment formed around the Prince St. Vladimir's Cathedral has its own, smaller (in comparison with the northern part of the island) scale of the street grid; two sustainable development areas meet here: the area of the Peter and Paul Fortress with an adjacent radial system of streets and the area of the Prince St. Vladimir's Cathedral with short streets and alleys outside the orthogonal grid.

A "sustainable development corridor" on the Petrogradskaya Side can also be distinguished. It covers large areas: the unique development on Kamennostrovky Prospekt and Bolshoy Prospekt of the Petrogradskaya Side. A special environment with characteristic morphological, typological and stylistic signs formed in the first decade of the 20th century along the entire Kamennostrovsky Prospekt [4]. This area was developed after the construction of the permanent Troitsky Bridge and cancellation of the ban on the construction of stone residential buildings on the Petrogradskaya Side. The phenomenon of this development is that this complete environment is formed only by significant and representative buildings which are either dominants or accents. Among the unique morphotypes of the development, a tenement house can be mentioned with its court of honor facing the thoroughfare,

with a developed structure of small courtyard houses, internal spaces with multiple pedestrian and visual links.

A territory covering the entire Bolshoy Prospekt on the Petrogradskaya Side can also be classified as an individual sustainable development area with similar characteristics, but with fewer accents and greater utility of the development. The area is represented by the only morphotype of the fire wall development, i.e. the tenement house; the environment is authentic, integral, complete.

The sustainable development territories revealed in island districts of Saint Petersburg (Vasilyevsky Island and Petrogradskaya Side) can be divided into:

- territories of ensembles and complexes (e.g. the city-forming ensemble of the Spit and the territories of historical industrial complexes);
- sustainable development territories leaning towards the existing dominants;
- sustainable development territories, leaning towards the lost dominants;
- "sustainable development corridors" covering extended spaces — development frontage of thoroughfares and adjacent courtyard spaces;
- territories of historical cemeteries.

#### 4. Conclusion

During the development of depressed environment areas located in close proximity to sustainable development areas. It is required to aim for the convergence of historical and modern spaces, conditioned by the continuity of the main principles of environment formation.

In terms of planning, this means preserving the traditional urban planning code, regularity, ensemble nature, and historical system of dominants and accents. It is necessary to note that the task of preserving a unique historical city demands a decrease in the dominant/accent function of modern development. It should be linked to sustainable development areas, historical accents and valuable environment-forming development.

#### Acknowledgments

The study was supported by Saint Petersburg State University of Architecture and Civil Engineering (SPbGASU) through the Grants of 2014 and 2018 years.

#### References

- [1] Kefala O V 2015 *Development of the planning structure of the Petrograd Side in the first third of the XVIII century* Bulletin of Civil Engineers **6(53)** 21-29
- [2] Georgi I G 1996 *Description of Russian Imperial capital city Saint Petersburg and its suburbs* (Saint Petersburg: Liga)
- [3] Mahrovskaya A V 1986 *Reconstruction of old dwelling districts of big cities on the example of Leningrad* (Leningrad: Stroiizdat)
- [4] Granstrem M, Zolotareva M, Slavina T 2018 *High-rise construction in historical cities through the example of Saint Petersburg* E3S Web of Conferences **33** 01028 1-9
- [5] Tsylov N I 2003 *Atlas of thirteen parts of Saint Petersburg* (Moscow: Tsentrpoligraf)
- [6] Stiglitz M C Kirikov B M 2008 *Architectura of Leningrad's Vanguard* (Saint Petersburg: Kolo)